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Agricultural Outlook Forum'98

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Proceedings

**Presented by the U.S. Department of Agriculture
February 23-24, 1998
Washington, D.C.**



PREFACE

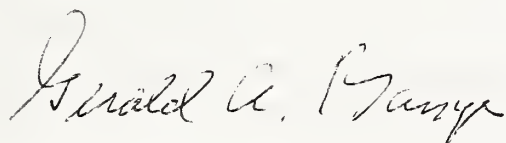
Agricultural Outlook Forum '98, the seventy-fourth outlook meeting sponsored by the U.S. Department of Agriculture, was held on February 23 and 24, 1998, at the Omni Shoreham Hotel in Washington D.C. More than 1,000 people representing all facets of the agricultural community took part in the Forum.

With a theme of "Agriculture's New Frontiers," the program covered a wide range of developments on the frontiers of farming as well as agricultural prospects for 1998 and beyond. Featured topics included biotechnology, risk management, transportation, marketing, trade, food safety, and conservation. In addition to government, industry, and academic experts, a number of farmers spoke to provide a first-hand perspective.

The speeches presented here also are available on the Internet at the following address: <http://www.usda.gov/oce/waob/agforum.htm>. Additional copies of this proceedings may be ordered from ERS-NASS, 5285 Port Royal Road, Springfield, Virginia 22161; phone 1-800-999-6779.

USDA released a new set of long-term projections at the Forum entitled *USDA Agricultural Baseline Projections to 2007*, WAOB-98-1. The report can be ordered from ERS-NASS at the address noted above or downloaded from the Internet at the following address: <http://www.mannlib.cornell.edu/data-sets/baseline/94005>.

For more information about this volume or the Outlook Forum, call 202-720-5447 or contact rbridge@oce.usda.gov.



GERALD A. BANGE
Chairperson
Outlook Forum Program Committee

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REMARKS

DAN GLICKMAN
SECRETARY OF AGRICULTURE

INTRODUCTION

Last year was an agriculture secretary's dream -- record farm incomes, record exports, strong prices, generous farm payments. This year things are generally good, but there are a few bumps in the road. Mother Nature hit us below the belt with El Nino, and faltering Asian economies have tripped up racing U.S. farm exports a bit. But U.S. agriculture remains on top of the world.

I know that it's traditional for me to stand here and rattle off a laundry list of priorities that together purportedly cause rainbows to vault from rural town to rural town. But that's not really government's role in the new American agriculture. Our farmers and ranchers are phenomenally competitive. Our job is to help keep them on a successful course.

Clearly, national economic trends of the past five years are a great reason for agriculture's success -- the President's economic plan has given us a strong economy with low interest rates and high employment. All of this helps farmers.

I'd like to talk briefly about just two issues today -- trade and research. My comments have little bearing on the price of corn tomorrow, or poultry next week, or milk next month. But they have everything to do with the future strength and competitiveness of American agriculture -- small farmer, agribusiness executive, soybean grower, cattleman, and everybody else involved.

Trade and research may seem quite different, but they are united in their importance to agriculture, and the degree of difficulty of conveying that importance to the general public.

TRADE

Most of us who are heavily involved with the economics of agriculture have a fairly easy time doing the math on trade: U.S. farmers and ranchers produce far more than our people could ever consume. Without world markets, the U.S. farm economy goes in the tank. And, as we phase down commodity payments, and they are no longer tied to the amount of production, we need to pick up the difference in foreign sales. The more aggressive we are in expanding our exports, the more we grow our farm economy here at home.

That's the straightforward macroeconomic argument, and it's a grand success story. U.S. agriculture is one of the few sectors of our economy with a huge trade surplus. Yet, we tend to hear more from the minority who are pinched by trade, than the majority who benefit in less tangible ways -- say stronger prices, when it's not so clear how much of that is due to exports.

Now, we're getting a bit of a lesson in the link between exports and farm incomes. I have a revised export forecast: We now expect the United States to sell \$56 billion in food and fiber this

year -- 2% off our numbers for last year -- \$2.5 billion off of our record high in 1996. The bulk of that dip, obviously, is due to the economic situation in Asia, with some impact from a strong corn and soybean crop in Argentina.

There are lessons here: we shouldn't put all of our eggs in one basket. We need to compete in markets around the world. But more broadly than that: we cannot hide from the global economy. What happens halfway around the world has consequences here at home.

We have a huge stake in global economic stability. That's why support for the International Monetary Fund is so important. Their job is to stamp out serious national and regional fiscal crises to prevent a global contagion. And, by and large, they do a good job.

The main reason we haven't lost more exports to Asia is because USDA extended \$2.1 billion in export credit guarantees. These guarantees, which depend on credit-worthiness, would not have been possible if the IMF had not stepped forward to help stabilize these economies and pushed countries toward serious financial reforms, greater market transparency, freer markets, and an end to cronyism. Without these IMF actions, another \$2 billion in agricultural exports would have been at great risk in the short-term and far larger amounts in the long-term. Our team, lead by Gus Schumacher and Lon Hatamiya has done an outstanding job aggressively using our authorities under GSM, and I want to make clear that we will continue to do so.

I want to thank Senator Lugar for his leadership in Congress on this issue. And, I should add that supporting the IMF has no impact on President Clinton's balanced budget effort. These are loan guarantees, backed up by collateral, and U.S. taxpayers have never lost a dime we paid into the IMF in 40 years.

In the bigger picture, the United States will soon be headed into another round of World Trade Organization talks. I know there's a lot of speculation as to how we're going to approach this next round. Let me assure you that this Administration has no intention of being a shrinking violet on trade. We have another year until countries sit down and lay out their objectives. But our position is clear: We will seek substantial improvements in the trading environment for U.S. farm products. We want major cuts if not the outright removal of all barriers to U.S. farm exports -- both obvious hurdles, like tariffs, tariff rate quotas and subsidies, and the more creative barriers, like bogus regulatory red tape and phony sanitary and phytosanitary measures. We will seek greater transparency and discipline over countries that hide protectionism behind science that is not as good as it should be. We will not let new barriers replace the old ones and impede genuine progress.

Many of you also probably know that we're looking at a situation where the last series of tariff and subsidy cuts under the Uruguay Round may finish well ahead of the next round of agreements. We need to find a way to bridge that time gap, and maintain the momentum of global trade liberalization. This Administration will be looking closely at our options and talking to folks in industry, and on the Hill, to find a way to ensure that there is no pause in our progress.

This way, we can carry on general liberalization that has already been heavily negotiated, and has

proven relatively painless for all countries, and focus our energies on new issues -- from State Trading Enterprises to phony science. This seems to me the way to go on this. We could move forward with what we're already doing, while we talk through new areas.

RESEARCH

Of course, trade wouldn't be nearly so critical an issue if it weren't for the phenomenal productivity of our farmers and ranchers. Throughout agriculture's history, the advances of science and technology have enabled us to stay well ahead of world food demand. With global incomes and populations growing fast, that's something it's imperative we continue.

I have a report I'd like to share with all of you, 'U.S. Agricultural Growth and Productivity: An Economywide Perspective.' It's available at the back of the room. I hope one winds up on your nightstand soon. This is the first government report to quantify the contribution of publicly funded research to the brisk pace of growth in U.S. agricultural productivity. What our team found was -- from World War II on into the 1990s -- public investment in agricultural research has been responsible for three quarters of all growth in U.S. agricultural productivity.

In addition to the increases in profitability these investments have given farmers, the report also says that consumers get a big return on their investment in the form of lower food costs. As farmers produce more, often at less expense, prices come down, and consumers spend less of their dollar on food. Less, in fact, than any other country in the world.

That's the good news. The not-so-good news is that funding for agricultural research has stagnated since the 1970s. My budget folks at USDA say that since 1985, research funding, in real terms, has declined by 15%. The potential consequences of this slow leak extend far beyond economics.

In his State of the Union, President Clinton called for the largest funding increases in history for the National Cancer Institute, the National Science Foundation and the National Institutes of Health. He made a powerful case by talking about the possibility of cures for cancer, for heart disease, for AIDS, and for other diseases. That was the biggest applause line he got -- for increased health research. Why? Because every Member of Congress understands and is aware of its benefit to the American people and the world. And, virtually every member of the American public understands it as well.

What we do in our agricultural labs is equally capable of revolutionizing life. After all, we should not forget that the explosive debate over human cloning started with a single sheep. And yet, except for people in production agriculture or the agricultural research community, the message and the context of this research remains an abstract mystery to most Americans. That is a prescription for the downsizing of agricultural research and productivity. And, it doesn't have to be that way. U.S. agricultural research has some amazing stories to tell:

In 1942, someone brought a rotten cantaloupe into a USDA researcher in Peoria, Illinois, who -- his title was -- an 'expert on the nutrition of molds.' Today, his portrait hangs alongside Thomas Edison's and the Wright Brothers' in the Inventors Hall of Fame. The name Dr. Edward Moyer

may not be as familiar as Alexander Fleming, who discovered penicillin. But it was Moyer who unlocked the mystery of how to mass produce it -- giving the world a miracle cure for common infections just in time to save many allied soldiers wounded on D-Day.

In 1945, a USDA agronomist who was part of General MacArthur's occupation force in Japan spotted a hearty, short strain of wheat that he did not recognize. He brought some seeds home, took them to a USDA lab in Pullman, Washington. They did some more work, then sent their research and the seeds along to CIMMYT, the international wheat research center in Mexico. The eventual result? Norin 10, the gene that launched the green revolution, enabling countries like India and Pakistan to increase their wheat harvests by 60%. At CIMMYT today, there's a shrine to Norin 10 with this inscription on the wall: 'a single gene has saved 100 million lives.'

No hospital in the world can make that same claim.

Today, we are still racing for ways to feed more people without wrecking the environment; to produce safer and more nutritious food; to change and improve our world.

-- We are building a catalog of every gene in our food, so we have a menu that let's us select disease- and pest-resisting qualities, nutrition, and other factors -- to create new varieties that allow us to produce more food, in harsher climates, with less pesticides and more nutrition.

-- Just last week, I announced a new variety of corn that, when fed to pigs and chickens -- well, plainly put means almost 50% less phosphorus comes out the other end. This is a huge, clean-water event ... one that's good for farmers, too, because they get to spend less on dietary supplements because the phosphorus in this corn is more readily absorbed by the animals.

-- We have space satellites tracking bugs in our fields, telling us just how much pesticides we need and where, doing right by the environment and by farmers' pocketbooks, saving millions of dollars in unnecessary chemical use.

-- We're adapting Gulf War scanners that identify nerve gas in the air to help us quickly spot hidden pathogens in our food, like E. coli and salmonella.

These are priorities the public passionately cares about. Yet most folks haven't the faintest clue that these efforts have anything to do with agricultural research.

We have only ourselves to blame for that. We talk about plant stress, and people assume we're piping Muzak into greenhouses. We need to talk instead about new super-crops that can grow in arid places like subsaharan Africa, revolutionizing the world war on hunger.

Instead, when we debate research, too often it devolves into intramural scuffles, such as which university gets how much money, from an increasingly more limited pot of money. I can say this because as a former Member of Congress from Kansas, I used to fight for money for my state schools, and I can't tell you whether every dime I fought for was critical to national agricultural priorities. Privately, many university leaders share this same concern with me. We need to ask:

what are our priorities? How much should we invest in each area? How do we make these investments relevant and understandable to all Americans? How do we communicate the message of what we are doing so people understand why this is important to them?

Unless we do this, the public will not understand the importance of agricultural research, and we will not get adequate funds to continue pushing the frontiers of our knowledge, keeping up the stunning, necessary pace of agriculture's growth. No one feels more strongly about this than Senator Lugar, who has made a career out of promoting agricultural research. We need to work closely with him on this issue, along with other leaders in government, at the universities, in production agriculture, in the anti-hunger, environmental and nutrition communities, as well. We must make agricultural research a top national priority. Quite frankly, we need to increase our investment in these areas. But we will only do so in the long-term if we can get that applause from the American people.

CONCLUSION

You will hear plenty of information about the challenges and opportunities we face in the year ahead. That's why I chose to take my time to give a longer perspective. We in agriculture are making critical decisions not just about the future of farming, but the future of our world. If we are smart about our choices, we can make a major contribution to a peaceful, stable, healthy and sustainable world, and by doing so, secure American agriculture's continuing success. I want to thank you for the contributions you make, and urge you to use this forum to share ideas on how we can work together to ensure the future progress and success of American agriculture and world food production.

Thank you.

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Outlook For U.S. Agriculture

Keith Collins
Chief Economist, USDA

My presentation this morning will cover the prospects for the domestic agricultural economy in the upcoming year. I will be followed by Under Secretary Schumacher who will focus on foreign agricultural developments. Together, our presentations will provide a general view of how the U.S. has and is expected to fare in the global market. Of course, the real meat of the implications for agriculture will be developed over the next two days in the many sessions of this forum. Consequently, over the next few minutes I will concentrate on what I believe are the most important developments to watch in 1998. I want to cover three areas: first, the macroeconomy; second, a few commodity market highlights; and finally, the implications for overall economic performance of agriculture.

Before beginning, I want to call your attention to the 10-year projections being released at this Forum. These are Departmental projections, developed largely by the Economic Research Service. I think you will find them quite valuable to you for assessing trends, identifying crucial assumptions affecting the agricultural economy and providing a benchmark for conducting policy analysis. Note that these projections were developed in late fall to support the President's budget and do not incorporate some new information that will affect the 1998/99 markets. Therefore some of the projections you will hear from me and others in this forum may differ somewhat from the first year or two that are presented in the baseline projections. We encourage your feedback on the value to you of these long-term projections.

(I) Macroeconomic Environment

Despite the considerable uncertainty raised by the Asian situation, the U.S. economy looks like it will support strong food demand in 1998. We are all watching the developments in Asia and their implications for the world's economies, including our own. At this point, world economic growth looks like it will slow from 1997's 3.1 percent to something closer to 2.5 percent. While less favorable for exports, such growth would still be stronger than the 1.9 percent averaged during the first half of the 1990's.

In the United States, after a very strong 3.8 percent growth in 1997, our analysts expect this year's real Gross Domestic Product to grow about 2.7 percent. A slowdown in corporate profits and consequently less business investment in inventories, a tight labor market, and reduced net exports are expected to contribute to the lower rate of growth. The Asian turmoil is expected to trim 0.3 to 0.4 percentage points off U.S. economic growth. After watching the U.S. economy on a tear in 1997 and initially worrying about the effects of the tight labor market, "irrational exuberance" and the prospects for inflation, it now appears the modest contractionary effect of Asia will do the restraining job that the Federal Reserve might have done anyway had the economy continued to grow in the 3.5+ percent range.

We know the stronger dollar will add to the U.S. trade deficit and be a restraining factor on U.S. economic growth. Even so, there are numerous positives that will keep the growth momentum going. Lower long term interest rates will support investment and construction. Thirty year mortgage rates are the lowest in 26 years. Consumer confidence remains near record highs, and inflation is likely to be little changed, held down by the rising value of the dollar and oil prices that recently hit a 14-year low.

While all of these macro statistics mean we can expect a firm base of demand for meat and poultry, dairy, horticultural products and processed products, they also mean good news on the expense side of farmers' cash flow accounts. With energy prices and interest rates down and feed expenses likely down, farm production expenses are forecast to decline a little in 1998, only the second time that has occurred in the 1990's, with the previous time being in 1992 when recession was ending, interest rates were falling and acreage controls were limiting plantings. (Tables 1 and 2 provide summary performance indicators for U.S. agriculture.)

(II) Commodity Market Highlights

Major Field Crops: Grains, Soybeans and Cotton

Key development--One year ago, we forecast that large U.S. and world crops of grains, soybeans and cotton would lead to a softening in crop prices and a rebuilding of stocks. Those forecasts proved to be fairly accurate as weather was generally conducive to crop plantings and crop development. In addition to large U.S. and world crops, the Asian currency crises has further contributed to the bearish price outlook for major crops. Compared with one year ago, the price farmers received for all crops during January was down 4 percent. However, the price drops have generally been larger for the major crops. The price of corn was down 4 percent, but soybeans and upland cotton were down 8 percent and wheat was down a whopping 17 percent in January. The season-average prices of corn and wheat are expected to stabilize in 1998/99, but soybean prices are expected to fall by nearly 20 percent next year as South American soybean production continues to increase and another large U.S. crop is projected. This outlook for stable-to-down crop prices and returns would be further amplified if the Asian currency crisis spreads to other countries.

U.S. and world crop production were generally exceptional in 1997/98. In 1997/98, U.S. wheat production turned out to be the highest since 1990, as wheat yields were record high. U.S. corn production turned out to be the third highest on record reaching nearly 9.4 billion bushels. U.S. soybean production exceeded the previous record set in 1994/95 by 210 million bushels, as planted acreage topped 70 million acres for the first time since 1982. And, cotton production of nearly 19 million bales was only slightly below the record set in 1994/95. Globally, wheat production and oilseed production set records in 1997/98.

Large U.S. and world production of grains, soybeans and cotton have lowered U.S. crop prices and raised carryover for 1997/98. U.S. wheat prices are expected to be down about 20 percent and wheat stocks on June 1 are forecast to be up by over 50 percent, compared with one

year ago. Soybeans stocks are forecast to nearly double this season, while soybean prices are expected to be down about 12 percent. Corn prices are forecast to fall by 6 percent in 1997/98 as carryover stocks increase by a modest 7 percent.

Lackluster growth in U.S. exports due to large world crops and the Asian currency crisis is also contributing to the drop-off in U.S. grain and cotton prices. Both wheat and corn exports are expected to be well below the average of the 1990's, and cotton exports are expected to be near the 1990's average in 1997/98. U.S. soybean exports, however, are expected to be record-high in 1997/98 as world demand for oilseeds continues to expand.

Despite the decline in corn exports, total corn use in 1997/98 is forecast to be the second largest on record, as domestic use is expected to expand by nearly 9 percent. For corn, growth in domestic use has continued to expand faster than growth in exports. From 1990/91-1996/97, domestic use of corn increased by 17 percent while corn exports were up 4 percent. Continued expansion of livestock and poultry production and lower corn prices are forecast to increase feed and residual use by 9 percent and food, seed and industrial use by 8 percent in 1997/98.

Even though stocks of major crops are expected to increase in 1997/98, stocks will continue to remain at modest levels for most crops, with the possible exception of wheat. The stocks-to-use ratio at the end of the 1997/98 season is forecast to be near 10 percent for corn and soybeans and about 23 percent for cotton. In contrast, the stocks-to-use ratio for wheat at over 28 percent would be the highest since 1990/91.

Turning to the year ahead for major crops, changes in relative returns and a 2-2.5-million-acre decrease in CRP enrolled acreage is expected to result in a small expansion in corn and soybean plantings, while acreage planted to cotton and wheat are expected to decline. Total plantings of major crops will likely be down slightly despite the decline in CRP enrollment, as lower crop prices and returns cause some producers to reduce planted area.

Assuming trend yields, U.S. **soybean** production is projected to exceed this past year's record, reaching nearly 2.8 billion bushels in 1998/99. **Corn** production is forecast at nearly 9.8 billion bushels, which would be 5 percent above last year and the second highest on record. But, lower acreage and a decline in yields from last year's record is expected to cause **wheat** production to fall by 9 percent to 2.3 billion bushels, and reduced planting could lead to about a 7-percent decline in **cotton** production in 1998/99.

Declining foreign production and improved macroeconomic conditions in Asia should enhance export prospects for corn in 1998/99, while large foreign supplies of wheat and soybeans are expected to continue into 1998/99, causing U.S. exports for these crops to remain essentially flat. U.S. corn exports are projected to rebound, reflecting reduced competition, especially from China. China is projected to swing from being a net exporter to a net importer, and Eastern Europe and Argentina are expected to export less.

Prices of corn and wheat are expected to remain firm in 1998/99. For wheat, a small increase in total supplies is expected to be offset by somewhat higher exports and domestic use.

The corn market would also appear to be in near balance as domestic use and exports expand to meet the increase in production. The exception is soybeans where another record crop and large foreign production are projected to lead to a further collapse in soybean prices in 1998/99.

The market for rice present an interesting contrast. Plantings are expected to rise, reflecting firm 1997/98 market prospects boosted by rough rice exports to Latin America and continued expansion of domestic demand. Global trade will be strong in 1998, particularly markets in Southeast Asia, including Indonesia and the Philippines where drought has reduced rice production.

Key uncertainty--The key uncertainty for the 1998/99 crop outlook is the weather. When will El Nino cease to influence weather and what will the weather pattern that follows mean for crop plantings and crop development this spring and summer? At this point, all major crop growing areas expect the Upper Midwest and Northern Plains have more than ample soil moisture. In fact, if there is a concern, it is whether soils in the Southeast and Southwest will be dry enough at normal planting dates. These areas typically begin planting corn late this month, cotton in April, and soybeans in May. The more that excess moisture delays planting in the South, the more likely producers will shift from corn to cotton and ultimately to soybeans. Excessive moisture could pose a similar problem for Eastern Corn Belt producers, although the current National Weather Service forecast calls for a dryer April and May. Delays in planting could leave producers with the choice of planting earlier maturing varieties, with the prospect of lower yields or switching to soybeans. Further switching of acreage to soybeans combined with the prospect of a record South American crop would be more bearish for soybean prices but supportive of corn prices in 1998/99. A wet spring followed by a dry summer would support price prospects for both crops and there are not ample stocks to prevent major price run-ups if a severe drought occurs. If, however, current good conditions for winter wheat continue and other crop yields are above trend, the current, somewhat bearish, price prospects could become much worse.

Major Animal Products: Livestock, Poultry and Dairy

Key development--The most striking developments in U.S. agricultural markets have been occurring on the animal product side, notably, the loss of export growth and the production effects of the cattle and hog cycles. With animal products accounting for 45 percent of gross farm receipts, the economic performance of this sector undergirds the well being of much of agriculture. For 1998, livestock and poultry producers will take a pounding--especially during the first half of the year as record-high per capita meat and poultry supplies drive down returns. Consumers will be in hog heaven as they will find one bargain after another in the meat case of their supermarket. Per capita meat consumption on a retail weight basis was 202 pounds in 1990, averaged 208-210 pounds during the mid 1990's but is expected to surge to an all-time high of 216 pounds during 1998. Obviously, such a high level of consumption can only be accommodated by sharply lower meat and poultry prices. The expected 4-1/2 percent increase in meat and poultry supplies that will move through domestic channels is being caused by the first decline in U.S. meat and

poultry exports in the 1990's, a surge of beef imports caused by the rising value of the dollar and weak Asian demand, large increases in pork and poultry production and more beef production than earlier expected.

Let's look into this a little deeper. **For the year ahead for beef**, we will get more supplies in the near term but less later on. A key development of 1997 was the continuing liquidation of cattle, a contraction which began in 1995. Much of the continuing liquidation during the past year has been due to high rates of cow and heifer slaughter. We do know that the very fast pace of cow and heifer slaughter began to slow in late 1997 and early 1998, but there is scant evidence that ranchers are retaining sufficient heifers to begin herd rebuilding and eventually turn the cycle up. Two factors jump out as discouraging expansion--weak prices for feeder cattle, while stronger than the past couple of years, are still below average and short hay supplies, with hay prices setting a record high for the month of January.

The upshot of the continuing liquidation is that beef supplies have not contracted here in early 1998 as we once thought would occur, and fed cattle prices are lower than once expected. Beef production is now expected to be up slightly during the first half of 1998 compared with a year earlier. This is keeping fed cattle prices in the low \$60's per cwt. With breakeven prices in the high \$60's, feedlots are taking a loss of \$5-10 per cwt on cattle now coming out of feedlots which depresses the price they pay for feeder cattle. This will not continue. With fewer cattle on farms, fewer feeder calves will be available to feedlots, fewer steers will be fed, fewer slaughtered and retail supplies of beef will shrink. The question is when? This is expected to begin this spring and could go on through the year 2000. In 1996, beef production was up 1.2 percent. In 1997, beef production was unchanged, and in 1998 for the year as a whole, we forecast a decline of less than 1 percent, although the drop in production will grow as the year unfolds and could be down 3 percent by the fourth quarter. The conclusion then is fed cattle prices will rise and feedlots will have to pay more for feeder cattle. By late 1998, fed cattle could be over \$70 per cwt, 20 percent above recent levels, and feeder cattle could be in the mid-\$80, compared with the mid-\$70's recently. This will mean better news for cow-calf producers. By 1999, returns to cow calf producers should be strongly positive and that would provide and incentive to rebuild herds, but this outcome hinges on good crops this year.

Pork supplies will be especially heavy in 1998 as a 9-percent production increase is expected to combine with export losses and pull 1998 hog prices a whopping 23 percent below the 1997 average. One key development has been the pattern of expansion. In many states we have heard continuing use of words like "permit," "inspection" and "moratorium" when hog expansion is discussed. Consequently, we have been watching to discern whether environmental, structural or other issues could restrain future hog expansion. Current expansion rates are only somewhat revealing. Some traditional producing states such as Iowa and Minnesota are expanding faster than the U.S. average. North Carolina is below the U.S. average. Southwest and western areas, such as Oklahoma, Texas, Utah, and Colorado, are all expanding faster than the U.S. average. The environmental questions will be addressed in a session tomorrow morning.

Broiler returns were reasonably good during 1997 and have remained above cash expenses even during the period of weak wholesale broiler prices experienced this quarter. In addition, export growth will be slower in 1998 but still positive as Russia, Hong Kong, China and Japan continue to be the major buyers. For 1998, we forecast that production will rise 5 percent, and with abundant meat supplies, broiler prices are expected to average only 56 cents per pound compared with 59 cents during 1997.

Lastly, for **milk** producers, the dairy market has been recovering since the very low prices experienced during the first half of 1997. Strong cheese and butter prices pulled the basic formula price (BFP) for January 1998 to the second highest ever for that month. Nevertheless, the milk-feed price ratio is not strong enough to signal milk production expansion and low hay supplies remain a concern. Consequently, milk production is expected to be about unchanged in 1998 compared with 1997. A good economy and expanding demand will keep milk prices firm, with the all-milk price expected to average slightly above the 1997 level. One uncertainty is the outcome of the Federal Milk Marketing Order hearing to establish a floor on milk used for class I and class II products. Because milk prices are seasonal and likely to go lower over the next several months, a floor, if established, would raise producers' returns above current projections. For example, a \$13.50 per cwt floor on the BFP could raise the farm level milk price by 25-35 cents per cwt during the second half of 1998 above what it would otherwise be. However, because the floor is expected to be temporary, little production effect would be likely.

Key uncertainty--Combine the meat surplus story and marginal milk expansion with the fact that feed grain stocks remain relatively low. A bad weather year in 1998 could cause very high feed prices. That would recommence the heavy cattle herd liquidation and spin dairy returns well into the red. Hog prices are now 35 percent lower than in 1996 when cash corn hit \$5.00 per bushel. So high, weather-driven corn prices in 1998 would have a much different effect on hogs than they had in 1995 and 1996. The hog industry would be severely affected and, with continuing shrinkage in cattle numbers, the meat and milk sectors would face serious dislocations, with consumers facing serious retail meat price increases in 1999 and beyond.

(III) Implications for the State of the Farm Economy

Entering 1998, the U.S. agricultural economy continues to come down from the record high income levels of 1996. In 1998, the overall economic performance is expected to be slightly below the average of 1990-97. Areas of concern continue to be producers in regions affected by bad weather, and some wheat, cattle, hog and dairy producers who have had to reduce cash balances or incur debt to withstand short-term financial pressures. Farm cash receipts set a record of \$202 billion in 1996 and were similar to that level in 1997, with crop receipts rising well above the average of the 1990s and livestock receipts at about the average. This year, market receipts are likely to decline to \$198 billion, as lower grain receipts reduce the total return to crops. Livestock receipts will decline a little as lower returns to hogs more than offset a small increase in cattle returns, while dairy remains about unchanged. Overall production expenses will decline a little, held in check by lower interest rates and feed costs.

Consequently, net cash farm income is forecast to decline to about \$52 billion, more than \$2 billion below the average of the 1990's.

The farm sector balance sheet exhibited further improvement in 1997 as asset values rose more than debt increased. Farm real estate values have risen every year since the mid 1980's, including a 6-percent increase in 1997. A 5-percent gain is expected in 1998. Farmers will take on more debt, reaching the highest debt level since 1985, but the overall debt-to-asset ratio is expected to decline from 15 percent at the end of 1997 to slightly under 15 percent at the end of 1998 as farm real estate rises.

Taxpayers will see stability in farm program costs with direct government payments, forecast at \$7.4 billion for 1998, down from \$7.9 billion in 1997, and accounting for only 3.7 percent of gross farm income. The big drop in farm payments will come for the 2001 crop year when the production flexibility contract payments drop from \$5.05 billion in 2000 to \$4.07 billion, about a 20-percent cut.

Consumers will see a year of modest food price inflation in 1998 with the Consumer Price Index for food in a range of 2-3 percent. In 1997, the CPI for food rose 2.6 percent compared with a 3.3-percent increase in 1996 when record high grain and milk prices pushed up retail food prices. In 1998, areas to watch are meats where retail pork prices are expected to decline by 4-6 percent; ample supplies of beef, poultry and fruit will also restrain food price increases. The effects of wet weather on spring vegetable harvests in California could also affect vegetable prices. For this spring's vegetable growing areas of California, heavy rains and flooding would interrupt harvest or damage fields of lettuce, broccoli, cauliflower, and other perishable crops. Already, we expect some harvest gaps as a result of the rains experienced this winter. It's a good bet that consumers will see higher prices for fresh vegetables this spring.

In 1998, American agriculture will continue to adjust to the increasing risks that accompany changes in domestic farm and trade policy as well as the profusion of new technologies and marketing arrangements that are emerging. These risk-creating changes will also provide the chance to lower costs, improve products, shift risks and open new markets internationally.

TABLE 1. ECONOMIC INDICATORS FOR U.S. AGRICULTURE (billion \$)

Item	Avg. 1990-95	1996	1997f	1998f
Farm receipts 1/	184.7	213.3	212.9	209.0
Assets	898.6	1,034.9	1,083.0	1,131.5
Liabilities	142.7	156.2	162.2	167.6
Equity	755.8	878.7	920.8	963.8
Farm real estate (\$/acre)	741.5	890.0	942	na
Exports (fiscal year)	43.7	59.9	57.4	2/ 58.5
CCC outlays (fiscal year)	9.8	4.6	7.3	8.6
Government payments	9.2	7.3	7.9	7.4

f=forecast

1/ Includes farm-related income. 2/ December 1997 forecast.

TABLE 2. RETURNS (\$/unit) 1/

Item	Avg. 1990-95	1996	1997e	1998f
Corn (acre)	174.31	202.33	200.30	194.83
Wheat (acre)	89.81	111.69	84.48	78.75
Soybeans (acre)	138.28	196.27	172.38	125.22
Cotton (acre)	211.91	303.89	247.43	252.77
Hogs (100 lbs)	6.72	5.96	5.13	-3.59
Cow/calf (per cow)	89.81	-43.85	-.01	12.87
Chickens (100 lbs)	5.30	5.36	5.80	3.50
Dairy (100 lbs of milk)	2.42	1.86	2.09	2.53

e=estimated f=forecast

1/ Crops--return over variable costs for program participants and soybean producers for crop years; cow/calf, dairy and hogs (farrow-to-finish)--returns over cash costs with dairy on marketing years; chickens--returns over total costs.

**Remarks by August Schumacher, Jr.
Under Secretary for Farm and Foreign Agricultural Services
U.S. Department of Agriculture**

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"Meeting the Challenge of Agricultural Exporting"

Good morning. I'm delighted to be here today and to have this opportunity to share with you my thoughts about ***"Meeting the Challenge of Agricultural Exporting."***

It is always a pleasure to speak at USDA's Agricultural Outlook Conference. It is especially rewarding for me to be sharing the podium with our Chief Economist and my good friend Keith Collins this year.

Keith once told me that he enjoyed being an economist because it is the one profession where you can gain great prominence without ever being right. Actually, I think someone else (George Meany) coined that phrase and we are quite fortunate to have Keith with us—he does seem to be right more often than not, or at least more often than the rest of us!

There are many challenges facing American agriculture in today's global economy. Successful exporters learn to "expect the unexpected." One need only look at the current financial situation in Asia as an example.

Certainly, as today's somewhat lower export forecast illustrates, the Asian financial crisis is having an impact on U.S. agricultural exports. The forecast decline of \$2.1 billion in our exports to Asia is noteworthy, but whereas ten years ago, such a decline as this might have been quite significant, it is manageable today.

For us in the United States and for those from overseas here today, agriculture is a critical element of our economy. Eight million people live on farms in the United States, or 3 percent of our population. Those here from the European Union, 15 million people of your populace live on farms, or 4 percent of the population. But in the rest of the world, one out of every two people--or 2.6 billion people--live on a farm.

While we may have fewer people living on farms in the United States than other countries do, the American food system (from inputs to farm to processor to stores) is our nation's largest employer. American agriculture is also the leading positive contributor to the U.S. balance of trade (averaging a net \$24.5 billion over the past 3 years). Today, U.S. agricultural exports support about 1 million U.S. jobs--with about one third of them in the farm sector. The asset base of farming alone is more than \$1 trillion.

The importance of trade to agriculture cannot be downplayed. Consider the Marshall Plan. Recovery of Europe's agriculture was critical to its post-war economic recovery. Soon after the Marshall Plan began rebuilding European economies, GATT was born. The U.S. Food for Peace program followed close behind.

U.S. agricultural exports have reached a new plateau

In the United States, this Marshall Plan-led, post-war, outward-looking farm policy is paying significant dividends for American farmers.

Since General Marshall's Plan was enacted in 1948, our global agri-environment has changed quite dramatically. Outdated and regressive policies of self-sufficiency, protectionism, and government control of markets are being challenged, reformed, or dismantled.

This is largely due to the fact that, for a variety of reasons that I will discuss in a moment, our exports are on a different *plateau* today than in years past. In the mid-1980's, U.S. agricultural exports were pretty steady, bubbling along at around \$30 billion from 1985 through 1988.

In 1989, they reached a new plateau of roughly \$40 billion and exports remained relatively steady at \$41 billion on average until 1995. In 1995, U.S. agricultural exports reached yet another plateau of sustained growth. If the projected level of exports for 1998 is realized, 1998 will mark the ***fourth year in a row*** where exports have topped \$54 billion, with exports *averaging* \$57 billion since 1995. Equally important, the average trade surplus in agriculture as I mentioned earlier has averaged \$24.5 billion during this same time period.

What is so fascinating is that exports remain so solid:

- *despite* the financial situation in Asia,
- *despite* the fact that China is for all intents and purposes out of the market,
- *despite* the record crops in the Southern Hemisphere, and
- *despite* the strength of the U.S. dollar.

What has happened is that trade reforms are kicking in, incomes continue to grow in developing countries and irreversible changes are taking place in marketing and distribution channels. ***These changes will continue to lead to a sustained growth in U.S. agricultural exports*** by making it difficult for countries to turn off the spigot for consumers who clearly have demonstrated a demand for U.S. agricultural products.

While Asia has been the catalyst of growth for U.S. agricultural exports, solid growth continues in other regions of the world as well. The USDA baseline calls for robust growth in global import demand, driven primarily by income growth in developing countries and an

increasingly open trade environment. The outlook for relatively strong economic growth in Latin America, North Africa, and the Middle East differentiates the 1997-2005 outlook from the past 10-15 years. Restoration of positive economic growth in the transition economies of the Former Soviet Union (FSU) and, particularly, Central and Eastern Europe (CEE) should halt declines in food demand and stabilize trade in those regions as well.

This is beginning to show up in our exports. Exports to countries in the Western Hemisphere, for instance, now account for nearly 32 percent of all U.S. agricultural exports. In *Latin America*, our exports are projected to reach *another high* in 1998, totaling \$10.8 billion—8 percent above last year's record level. U.S. agricultural exports are up to countries throughout Latin America, with the most striking growth coming from Mexico. U.S. agricultural exports to *Mexico* are projected to total \$5.8 billion this year which is 14 percent above the previous record set just last year.

What is interesting to note is that one of the reasons exports to *Mexico* are up is because when you consider the effects of differential exchange rates, the *Mexican peso* is appreciating against the *U.S. dollar* and this appears to be driving import demand. On the other hand, in *Canada*, the opposite is true. In part because the Canadian economy is much more dependent on exports of commodities (raw metals, timber, wheat, etc.), the *Canadian dollar* is taking a stronger beating than the *U.S. dollar* as a result of the situation in Asia, and the *Canadian dollar* is depreciating against the *U.S. dollar*. Yet U.S. agricultural exports to Canada continue to rise to record levels! In 1998 they are projected to total \$6.9 billion—up 5 percent over 1997's record level. And yes, that is 6.9 billion *U.S. dollars*! Go figure!

Mexico is an example of why there is hope to believe that—because of the IMF reforms--the crisis in Asia will be short lived and exports may rebound sooner than some might anticipate. In 1995, U.S. agricultural exports to Mexico were severely affected by the devaluation of the *Mexican peso*. American agricultural exports declined to \$3.7 billion. Even though the peso did not recover all of its value, the peso did strengthen and in just one year, U.S. agricultural exports to Mexico rebounded and our exports to Mexico have set new records every year since.

I am not going to predict that the IMF reforms will necessarily have the same degree of success in Asia as in Mexico. Certainly having NAFTA in place helped Mexico stabilize relatively quickly. But other factors, such as rapidly modernizing marketing and distribution channels are not unique to Mexico, and these factors are an important catalyst for continued market growth.

Changes are taking place in food distribution and marketing channels

In 1931, when the Empire State Building was built in New York City, it was the tallest building in the world. It took more than 40 years before a taller building was built—first, the World Trade Center in New York and then the Sears Tower in Chicago. It took more than 23 years for the title to be passed once again, but now a new “World’s Tallest Building” is being built practically every year. I have been told that the next World’s Tallest Building is already under construction in Shanghai, China.

Similar changes are taking place in food distribution and marketing channels in practically every country. Just a few years ago, “mom and pop” retail outlets dominated the landscape over much of the globe. There were no wholesale clubs, chains or discounters in Latin America or Asia. But a lot has changed in the last five years or so.

Today, there are supermarkets in Sao Paulo, Brazil with 75 checkout counters and clerks on roller blades doing price checks. Wal-Marts, Gold Clubs, and other discounters are springing up in Mexico, Hong Kong, China, and elsewhere and in a very short period of time have become a major market force. In some instances, companies are better off going to Wal-Mart than to Shanghai to make contact with overseas retailers. There is also a tremendous revolution under way in the food service sector, to meet a growing demand for western-style food.

These changes help explain why U.S. exports of high value products continue to be strong and why they will continue to account for a growing share of U.S. farm exports. Despite only moderate economic growth overseas, U.S. exports of high value agricultural products continue to set records.

The world is changing rapidly, and we are focusing our energies on helping U.S. exporters keep up with these changes. As the world’s premiere food exporter, we must be aware of what consumers want and be tied into new distribution channels. We have asked our attaches across the globe to pay more attention to these changes, and now they regularly report on new players, new channels of distribution, and factors that affect the competitive landscape.

We know it is not always good enough any more to just show up with the right product at the right price. As competition increases, you have to be able to help retailers improve their margins as well. Much of our effort is geared toward helping American agriculture combine their strategic marketing efforts with American innovations like category management and inventory control systems to strengthen ties with retailers.

Competitive Pressures and Challenges Facing U.S. Agriculture

There is no question that the competition is fierce. The outlook for U.S. agricultural exports is heavily influenced by competitive pressures that differ by commodity and can affect price and/or quantity of sales. One of the primary sources of this pressure is the rising value of the U.S. dollar, especially against the currencies of our major competitors. This has the effect of making U.S. exports more expensive to our customers, relative to those of our competitors. Unfortunately, the dollar has been rising against the currencies of all our competitors.

There are commodity-specific competitive pressures that pose challenges to U.S. exports as well. Record production of soybeans in South America will continue to pressure prices in 1998. In the longer term, these pressures will continue. We expect South American production of grains and oilseeds to continue to exert competitive pressures, offering increased competition to U.S. suppliers in third country markets. Likewise, Chinese corn and East European corn and feed wheat when available for export also have been and will be market factors.

In addition, we will continue to face stiff competition in markets around the globe. Our annual review of the export promotion activities of the 22 countries that account for our major competition found that just like the United States, many of our competitors have ambitious export goals.

We aren't the only country focusing our efforts on market intelligence, and market promotion. The EU and other countries assist their producers and small business to develop foreign markets through activities similar to our Market Access Program and Foreign Market Development Program. Market promotion by EU countries is estimated at \$400 million in 1995/96, with about one-half of that amount provided by EU-member governments. The rest of the funds come from producer-funded organizations and other fees.

Australia, Canada, and New Zealand have strong national government promotion agencies and rely heavily on their statutory marketing boards to carry out market development activities for producers of specific agricultural products.

In addition to market promotion activities, the EU also carries out an extensive subsidy program. Of the \$7.2 billion budgeted by the EU in 1997 for export subsidies, over 85 percent was for exports of high-value products such as fresh and processed fruits and vegetables, wine, dairy products, and meat and meat products.

Trade reform

Some of our competitor's practices such as the uses and abuses of export subsidies, unfair, trade distorting practices of state trading enterprises, and unabashed manipulation of imports through the administration of tariff rate quotas underscore the need for further trade reform.

The Uruguay Round and the World Trade Organization (WTO) are just the beginning of a new era in trade relations that will move the world toward freer trade. All members of the WTO must continue to work together to move along the path toward increased trade liberalization. This multilateral process is the best way to ensure fair trade, to open new markets, and to resolve subsidy or access problems. The United States intends to meet its WTO commitments fully *and* we expect other nations to do so as well.

We look forward to continuing the trade reform process when the next round of multilateral trade negotiations on agriculture under the WTO starts in late 1999. The United States is examining very carefully what is and is not working. First and foremost is to identify problems related to implementation of the current Uruguay Round Agreement.

Tariffs

High tariffs shield producers from the realities of the marketplace, and fuel the need for expensive subsidies and price supports. For example, U.S. farm and food products can face tariffs of 100, 200, and 300 percent or more in some markets. Our own import duties average less than 5 percent, while bound agricultural tariffs worldwide average around 56 percent. While

we have made good progress in reducing tariffs, we need to get these high bound tariffs down further.

Tariff-Rate Quotas

The establishment of a tariff-rate quota (TRQ) will not result in new access opportunities if it is implemented in a restrictive manner. Therefore, TRQ administration is one of the topics already identified by the Committee on Agriculture as an area for further discussion.

State Trading Enterprises

The United States also believes that state trading enterprises should not be allowed to circumvent export subsidy limits. Therefore we are seeking greater transparency in the operation of these entities through the WTO Working Party on State Trading Enterprises. We believe this effort will help identify practices that may need to be disciplined in future negotiations, both for export and import monopolies.

Export Taxes

From the U.S. perspective, export taxes are just as trade distorting as subsidies. Many export taxes hurt our competitive position in the export of value-added products. They shield foreign processors from fair competition in export markets by artificially subsidizing raw inputs. In the long run, they hurt all of us because they convince developing countries that the world market is not reliable and encourage inefficient internal farm policies aimed at artificial self-sufficiency.

With our new farm policy, the United States is continuing its commitment not to restrict grain exports when global supplies are tight. As you know, we upheld that commitment last year. Foreign buyers are guaranteed the same access to our supplies as domestic users, especially livestock. In addition, we have shown extraordinary restraint in the use of export subsidies on grains. The EU has not shown the same restraint. The recent global supply situation simply does not warrant the use of subsidies. World grain stock levels, measured as a percent of total use, have remained at or near historic lows.

Non-Tariff Barriers to Trade

In addition, we will continue to work to prevent unjustified non-tariff barriers to trade, especially sanitary and phytosanitary measures. Too often these measures are merely a guise to protect domestic agriculture from import competition and fail to adhere to the WTO principle that such measures be grounded in sound science. We will work through the WTO to encourage the adoption of international standards that facilitate trade while giving full protection to consumers' health and safety. Consumers have the right to insist on such safeguards. As we know from the painful food scares of recent years, agriculture is quick to feel the blow if consumers lose confidence in the safety of what they eat.

As Peter Scher, Special Trade Ambassador for Agriculture in the office of the U.S. Trade Representative said in a recent speech, "In order to maintain public confidence in the U.S., Europe and elsewhere, in our handling of health and safety issues, it is absolutely vital to retain the [SPS] agreement's fundamental reliance on science and risk assessment. That is the only way to successfully address 'consumer concerns.' I can not imagine a system which relies on non-scientific, non-transparent factors as one which instills confidence in the public in the safety of their food supply."

When one looks at the major agricultural issues currently causing tension in the U.S.-EU relationship--beef hormones, specified risk materials, and EU approvals for new biotech products--it is clear that they all relate in some way to the need for a science-based approach to health-related trade issues. In fact, the science-based principle as embodied in the WTO rules, and even the credibility of the WTO itself, now faces a crucial test with the beef hormone issue. It is critical that the EU does the right thing here--comply with the WTO dispute settlement finding and remove the scientifically unjustified ban on imports of our beef.

In 1997, USDA took a leadership role to ensure that farmers and consumers around the world have access to approved products of modern biotechnology. We have worked tirelessly in EU countries, Japan and elsewhere to convince policy makers of the need for food safety decisions to be based on sound science. Sound science must prevail in every case, not simply when it is convenient.

In the future, health-related agricultural trade problems will probably be more numerous and more varied than we can imagine, and it is vital for all of us that the principle of science as the basis for resolving them is firmly established now.

Asia Impact on U.S. Agricultural Exports

Right now, the number one question mark for this year and probably next year as well--for the United States and for our competitors--is Asia. As many of you know, last month, I along with Lon Hatamiya, Administrator of the Foreign Agricultural Service, and Christopher Goldthwait, USDA's General Sales Manager, traveled to a number of Asian countries on a fact finding mission.

- Our first goal was to get a better assessment of the situation and to see what we could do to stabilize the critical trade in food, cotton and hides to these important countries.
- Second, we wanted to evaluate these countries' use of the \$2 billion in Commodity Credit Corporation (CCC) export credit guarantees, and
- Our third objective was to analyze the effect of the currency problems on the domestic food situation of the most heavily affected countries, especially South Korea and Indonesia.

The Asian financial situation has taught us that ours is indeed *a global economy*. East Asia is an important market for America's farmers. Overall, it accounts for 40 percent of our agricultural exports, or \$23 billion annually. During 1991-97, Asia accounted for 45 percent of our export growth. ***But as I said earlier, I believe the crisis is manageable.***

In our analysis, the current Asian market can be divided into *three tiers* based on financial stability: Countries in the first tier, ***Taiwan, Japan, China, and Singapore***, will continue to show stability in most products with some softness in higher value consumer products and limited impact of the strong dollar. These countries accounted for 75 percent of our exports to Asia and 30 percent of our agricultural exports world-wide in fiscal year 1997.

The second tier countries, ***Malaysia, Thailand, the Philippines, and South Korea***, account for 9 percent of our exports. We expect a softening in exports to these markets and we have targeted them through export credit guarantee initiatives totaling \$2.1 billion. Of this, \$1.1 billion is for Korea and \$1 billion is divided among the other countries.

Indonesia, which we put into the third tier, imported \$767 million of U.S. agricultural products in fiscal 1997. It will be the most seriously affected in the short term. We expect little use of GSM programming here until the effects of the stabilization program begin to take hold.

Supporting The International Effort

The situation is manageable, but it is crucial that we support the international effort, led by the International Monetary Fund (IMF), to help countries in the region help themselves. That is very much in the interest of America's farmers and the American people in general.

The IMF, whose mission is to promote financial stability, trade, and economic growth, is the right institution to lead the effort to help the affected Asian economies. Only if these countries have stable, growth-oriented economies will we see global trade, including agricultural trade, recover and reach new heights.

The stakes are too high for inaction. USDA is working with the Department of the Treasury, the IMF, and the World Bank to maintain the flow of U.S. agricultural products to Southeast Asia and to help our Asian customers weather their financial storms. The IMF-led financial assistance plans in Thailand, Indonesia, and South Korea are critical to our efforts. The recovery of U.S. agricultural exports will depend on the success of IMF-led efforts to stabilize the Asian economies and bring about structural reforms and trade liberalization.

In the ***short term***, the IMF-supported trade and investment reforms are helping to steady the uncertain financial environment, which is critical to commercial trade. In the ***long term***, IMF-supported trade liberalizing measures will benefit U.S. agriculture by ensuring that structural reforms will allow our products greater access to these markets. Together, the IMF plans and the GSM export credit guarantees will help ensure that the United States remains a reliable supplier of agricultural products to the region.

It is important to keep in mind that despite financial problems, *Asia remains an important market with much potential*. The factors that made Asia strong economically in the past will fuel its recovery in the future. These include a high rate of savings, low inflation, a well-educated population, and economies that, for the most part, are still growing. The medium-term fundamentals will become sound with the elimination of financial restrictions, reductions in government directed investment, and elimination of monopolistic trade agencies. Ultimately, the IMF-led reforms in these countries will lead to more transparent, freer markets in which U.S. agricultural products will find it easier to compete.

This somewhat optimistic outlook depends on these governments continuing their reforms and making some difficult changes on how the business of government and the private sector is conducted. Most of the Asian officials with whom we met seem ready to grapple with this challenge. But only a few of the difficult steps have been taken.

Long-term trade prospects

In closing, the strong performance of U.S. agriculture exports over this last decade, and especially the last few years has been supported by many factors and developments within the U.S. and around the world. Many of these should continue to support growth, certainly over the longer term.

The Department's baseline projections for U.S. agricultural exports remains basically the same. The total value of U.S. agricultural exports is projected to rise from \$57.3 billion in 1997 to \$62.6 billion in 2000, and approach \$85 billion by 2007. USDA's Economic Research Service estimates that exports may grow 3.9 percent annually from 1997 to 2007.

Despite prospects for slowed demand in Southeast Asia over the next couple of years, projected U.S. trade gains over the next decade are driven by relatively strong economic growth in most developing regions, including China, South and Southeast Asia, Latin America, North Africa, and the Middle East.

The projections are based on our belief that the current global movement toward trade reform underway in many developing countries will continue. Similarly, the development and use of agricultural technology and changes in consumer preferences are assumed to continue to evolve based on past performance.

But the Asian situation affecting some of our fastest growing markets and the steady appreciation of the U.S. dollar over the last year poses a challenge and provides a warning. We have limited control over many of the key economic factors affecting trade. We can't always count on conditions to be favorable to economic and trade growth at any given time. What we can do is keep our sights set on growth opportunities wherever they arise.

Thank you for listening. Keith and I would be pleased to take your questions.

Panel Discussion on Agriculture's New Frontiers
Transcript of Discussion

Moderator: Scott Kilman, Staff Reporter, The Wall Street Journal

Panelists: Donna Reifschneider, President-Elect, National Pork Producers Council
and livestock producer

Kathleen A. Merrigan, Senior Policy Analyst, Henry A. Wallace Institute for
Alternative Agriculture

Robert Carlson, President, North Dakota Farmers Union who raises bison and
grain near Glenburn, ND

Charles Kruse, President of Missouri Farm Bureau, who operates a cotton and
grain farm near Dexter, MO

Claus Conzelmann, Vice President of Biotechnology Coordination, Nestle Group

Carrol D. Bolen, Vice President, Pioneer Hi-Bred International, Inc.

Scott Kilman: I would like to turn to the farmers first. Mr. Kruse, I was in the Boot Heel of Missouri last year looking to see how the farmers were adjusting to the end of the traditional farm programs. How are farmers coping in Missouri, and who do you think the winners and losers are going to be from the end of the traditional subsidy programs?

Mr. Kruse: Scott, thank you very much, and good morning, everybody. I'm delighted to be here and feel privileged to be a part of this excellent panel. As Scott just mentioned, I think the FAIR Act, the 1996 Farm Bill, put into place a fundamental change in agriculture and put us on a glide path out of government control of programs in agriculture. I think, so far, the '96 Farm Bill is working very well. Obviously, the jury is still out in a lot of regards, but I think the fact that we as producers can now base our planting decisions on market signals rather than complicated, complex, hard-to-understand government programs is very positive. This coming year, 1998, we are going to really see how this works, because if the predictions at this point are correct, we are going to see a shift out of cotton acreage--a pretty sizeable shift--into primarily corn and soybean acreage. This would not have happened in the past because producers were rigidly locked into planting to protect our base acres and planting certain crops based on historical perspectives. There was no looking to the market for signals as to what to plant. In talking to farmers I find a very positive response to the '96 Farm Bill in terms of being able to plant for market signals and I personally feel this way.

I do think that there are some things we need to really focus on, and I think that as we look to the future after 2002, in whatever direction we take in terms of a new farm bill, I think that we must focus on three very important issues. Trade is so vital and as we have already heard this morning from my good friend, Gus Schumacher, and from Keith Collins, we have to really focus and really beat the drum to keep the doors of trade open. I was very pleased that Gus talked about using "sound science," because that is so important. Regulatory relief and tax relief are two other sources that I think are vital to the future of agriculture. When we talked initially about going into this new phase of market-oriented agriculture with the new farm bill, the deal, so to speak was, that we're going to have a glide path of government pulling out of agriculture and in return, farmers and ranchers in this country are going to get regulatory relief. We're going to get tax relief and we're really going to continue to put an emphasis on trade. I think we absolutely must focus on all of these issues and I think that we must somehow use common sense and sound science as we deal with all of them. So, again, my sense is that at this point the new farm bill is being embraced quite well. The events that have happened over the last few months in Asia have been a reminder that we truly are in a situation where what impacts certain parts of the world will come back and impact us as well. I'm excited about the future, I'm excited about the direction we're going, and I think that if we use common sense and good logic dealing with the issues--particularly in trade, tax, and regulatory issues--we're going to find agriculture going in a very positive direction.

Mr. Kilman: Mr. Carlson, you've talked about self-empowerment for farmers in the Northern Plains. It's been interesting to me that on the Northern Plains where wheat is the major crop, because wheat is really the only crop that can grow there well, we've seen a big movement towards a new generation of co-ops. What's driving that and how big is that trend going to be?

Mr. Carlson: What's driving the desire for new cooperatives, particularly in the Northern Plains, is that the producers see themselves as facing greater risks today. There are four reasons: Number one is that we all know Federal farm program support, supports prices, supports payments, deficiency payments, Freedom to Farm market transition payments, are going away or are being phased out. I think that's a reality--support prices and the rates are frozen. In particular, the ad hoc disaster programs, which were important to us a number of times, about once or twice a decade, actually, are going away, too. Really, about the only thing we have left as a safety net is the crop insurance program and that as well is under some attack. In reality, we need to make some improvements there.

The second factor involving more risk for producers is more liberalized trade. We are not protectionists at the Farmer Union, but we do know that more liberalized trade means that we, as producers, face more competitors around the world. And, if you live where I do, 50 miles from the Canadian border, you can see the effects of that competition in products like wheat, durum, and small grains every day from the Canadians and know that there is maybe some up-side potential, but there is down-side potential as producers are faced with more competition. And, there is less of a chance that domestic prices will rise above world prices, as well.

Number three, there is more concentration in the food processing business. Over the last 20 years or so, we've seen just a hand full of giant corporations really control the processing and production of a great many of our commodities, from flour milling, to corn sweeteners, to livestock

slaughter. Ironically, at the time when producers have more competition in the global marketplace, we have less competition because there is more concentration among the buyers for our products. Finally, the industrialization of agriculture is a threat to family farmers in many sectors of agriculture.

So producers have looked at how we can protect ourselves in this new environment. Realistically looking at these trends, what can we do to help ourselves and what can we expect from Government? I'm going to concentrate on what we can do to help ourselves, although there are some things we can talk about Government doing, too. How can we improve farm income? How can we stabilize the income of our operations so that we can make the technological adaptations and advances necessary, gain efficiency, and be world competitors in agriculture? One way, and I think the best way, is to help ourselves through new value-added cooperative ventures. We as producers need to move further up the food chain to capture more of the value of our finished product. If you look at the food market, you may ask, how can producers hope to get into the food processing and marketing business? Well, the food business is a huge business--a \$705 billion business. Consumers have shown us they want new and convenient products, they want more variety, they want more choice. There are all kinds of niches in that food market that producers can fill and we have some unique advantages. The greatest advantage is that as producers owning a value-added processing cooperative, we have total quality control in production and processing. The product retains its identity from the producer right through to the consumer. We farmers that are a part of those new cooperatives also recognize that the food chain really doesn't begin with what the farmer produces. That's the traditional way we in agriculture look at farming: We're the beginning of the food chain, and the people eat what we produce. The food chain starts with what the consumer decides they want to eat. And, we have to learn to produce and supply it. We have to be creative and imaginative, and look for ways to diversify our incomes through some of these new value-added cooperatives. I belong to two: a bison cooperative and a pasta cooperative. After some initial rocky starts that are common in any business, both are now very successful and they are a very, very important part of our farm's operation as well as of our family income.

I'll conclude by saying that the vision we often are presented with in agriculture is that U.S. producers have to be the most competitive in the world to capture world market, and therein lies our opportunity. Well, what that really means is that we have to find the lowest common denominator in production costs in the world. That's a challenge and it's certainly one that we try to meet, but it's kind of a bleak challenge, you know--get your costs down--and we're in such a mature industry. We've been producing in this world for 10,000 years. Saying "my vision is to be the cheapest producer," may be something we can find a little bit of inspiration from, but I think there is a lot more to be gained from saying, "how do we move ourselves as producers further into the value-added food chain"? That's where I think a brighter future is and I really think that we've just barely scratched the surface on what we can do there. So, that's my optimistic vision of the new frontier in agriculture.

Mr. Kilman: How big of a trend do think that's going to be? I was in North Dakota last year and visited with Northern Plains Premium Beef people as they were trying to start their organization, and it faltered, largely because of a blizzard came up and killed a lot of their cattle. They were strapped for cash and they couldn't raise a money for the initial investment that they needed.

Now they are trying again. You have already seen two of the corn milling cooperatives struggle financially and have to be bailed out to a degree by the large millers--Cargill and Archer Daniels Midland. So I guess that raises a question in my mind. There have been some successes but we've also seen already some pretty big failures. I know you're a proponent of this, so you're going to be optimistic, but realistically, how far is this going to spread, if you are looking 10 to 15 years down the line?

Mr. Carlson: I won't go into details, but those corn milling plants probably really weren't failures. Those were entrances into a highly concentrated business; they were very, very large structures. That Provo plant was a \$256 million plant. Their arrangements, in the case of Minnesota Corn Processors, with ADM and Provo's with Cargill, shouldn't be viewed as a failure. Those farmers that still own that cooperative have made an agreement with the major companies to operate and market the product. They're still getting a return on their equity and they're still rather satisfied with it. It didn't turn out to be quite what they wanted, but they are somewhat satisfied. To get quickly to your other question--how big will the trend be--I do know that it is spreading out of the Northern Plains. Let me say that Northern Plains Premium Beef, a cooperative designed to slaughter beef and produce a premium beef product, is being reorganized and is in a capital drive stage to be a smaller, more high quality plant. We are just in the process in North Dakota, and our State Farmers Union is leading it, to develop backgrounding livestock feedlots in preparation for finishing lots and that plant, so that's being restructured. One of the most important things you need in a cooperative is a sound, dispassionate feasibility study and business plan. I think that the trend won't be like a prairie fire, which some people talked about for a while--coop fever. It has grown and it will grow. We see some new cooperatives. The National Farmers Union is in the process of organizing a cheese cooperative in Texas, a cheese cooperative in Wisconsin, some soybean cooperatives, small crushing cooperatives, and value-added soybean coops in some of the Midwest States. It'll grow as farmers realize that their economic futures need more stability. And farmers aren't stupid--they'll figure out a way to do that, and if they don't know about cooperatives, they'll learn about it.

Ms. Merrigan: Scott, could I jump in here for a second? I think it's also important as we look toward the new frontier of agriculture, to think about Government policies and about where our Government resources go. These new value-added cooperatives are a great opportunity for farmers to hold more of that food dollar at the farm level. I look at USDA's budget and I see only \$1.7 million devoted to the cooperative grant program. This program facilitates the kind of feasibility studies that Bob's talking about and it is a program that farmers really need. We've got a \$60 billion USDA budget and 100,000 USDA staffers. As we cross over into the new frontier, the question to me is whether we will have the courage to successfully shift resources to these cooperatives and help farmers out.

Mr. Kilman: And there are already some financial advantages, aren't there? I think when a cooperative raises stock, it's treated differently than if it is a publicly-traded company. I think there are some advantages in North Dakota where the State has a loan fund for those sorts of things.

What I wanted to ask both of you is, what's going to happen as world stockpiles rebuild and grain prices fall again? The last few years you've had the new farm program come in. Currently the

transition payments are still high, and you had relatively high grain prices, and the farm economy for most grain farmers has been pretty strong. In the next few years you are going to see two things happen--you'll see subsidies fall off and you'll probably, if we have a normal weather pattern, see stockpiles rebuild. How big of a shakeout do you think there's going to be among farmers as they cope with falling subsidies and falling grain prices?

Mr. Kruse: Well, I think these are certainly some of the unknowns as we try to see how the new farm bill is going to work. That's why I think it's so important that we do everything we can to promote trade and keep the doors of trade open. That truly is the future of where we are going. For example, we have to get fast track authority passed this year because it is vital that we continue to negotiate multilateral trade agreements. And, weather, Scott, as you just mentioned, and as Keith Collins and others mentioned this morning, is certainly a factor in this. I really believe that farmers basically like to plant based on market signals, not based on a government program, but I think that makes it so much more important to really get involved in risk management, to pound on the doors all over the world of free trade and make sure they are open and make sure we're using sound science to develop trade agreements and to resolve trade problems. Again, we've got a lot at stake here. We've got a lot to do, but I think we can come through this scenario and be stronger. You know, it seemed like every time we had a set-aside program, it encouraged other countries to step in and fill that void that we were leaving in the marketplace. I think we're heading in the right direction. I think that certainly doesn't say that there are not some concerns and it certainly doesn't say that there are not some issues that we have to resolve, and resolve in the right manner.

Mr. Kilman: But, while farmers have to become better managers and use crop insurance and hedge, it sounds like you are assuming that there's going to be some kind of contraction among farmers--farm numbers have been falling since the 30's, but do you see the farm contraction speeding up now because of the changes in the farm program?

Mr. Kruse: You mean number of farms?

Mr. Kilman: Right.

Mr. Kruse: I don't necessarily see that. I think we've been seeing the size of farms become larger over the last 50 years or more and we've seen there are fewer people involved in production agriculture today than there were 10 years, 20 years, and 30 years ago. I think that trend is going to continue. But, I don't see a dramatic shift of people leaving production agriculture and operations becoming dramatically larger. I don't think that because of this we're going to see a tremendous shift overnight.

Mr. Kilman: Mr. Carlson, Do you agree with that? Do you think there is going to be a faster contraction because of the end of the farm programs?

Mr. Carlson: Yes, I do. Certainly we've seen it in my wheat State of North Dakota and I think we'll see it throughout the Great Plains or the wheat areas. We've seen wheat prices drop at our elevators to \$3 to \$3.30 a bushel. That doesn't recover people's cost. You know, it's interesting to me, and I predicted this would happen with the new Freedom to Farm program, as did many

others, the payments that we got when prices were high were capitalized into land. Now, the only thing that a farmer really controls in his cost of production and in the price he receives for his product, the only thing he can really control is what he pays for land. I think we have land over-capitalized--both in terms of purchase prices lately in my State--I won't speak for Mr. Kruse's State--and certainly in cash rents, and I think this will be the year when people recognize that. We saw in our State a shrinkage by 2,000 people last year in what I call the mid-sized commercial farm category with incomes between \$10,000 and \$100,000 gross incomes. We've seen some large farms crash rather spectacularly lately, too. The lenders are worried in our State, especially where areas have been hurt by production losses due to some diseases in wheat.

You know, if I could make just a comment on the planting flexibility, in the last round of the debate leading up to farm program, there wasn't one viable alternative that proposed sticking with a supply management system. And even under the old farm bill, we could flex 40 percent of our acreage into other crops. I expect what we'll do--and in my State, everybody that I know of is trying to figure out what to grow other than wheat--we will grow a lot of oilseeds and we'll probably depress that market and we'll bounce around with more volatility. That's why I say there's more risk. What I think we need to do is unfreeze the loan rates that are frozen, I think, at too unrealistically a low level. I think we should bring back the farmer-owned reserve. Now, I know that isn't going to happen and some people will throw up their hands in horror, but we have a very large farmer-owned reserve right now. It isn't a program; it's something farmers are holding in their grain bins. I think we have some record quantities of wheat in farmers' grain bins, so I think we need to look at some ways to improve risk management for farmers. I think it's almost inevitable that land prices will decline.

Mr. Kilman: Do you think this is really the last farm bill or will there be some other type of income support program that will be brought in after 2002?

Mr. Kruse: The jury clearly is still out on that. As we get closer to 2002 and we evaluate this farm bill and where we go in the future, I think there will be a lot of debate, lots of discussion, lots of issues evaluated between now and then. I don't sense the will in the Congress and at this point, in the Country, among producers to go back to what we previously had. I suspect there may well be something beyond 2002, but at this point, I don't see going back to the type of farm bills that we've had in the past.

Mr. Kilman: Mr. Carlson, what do you think?

Mr. Carlson: Why, I don't think we'll go back to supply management-based farm bills. I don't think that we will maintain a decoupled payment like we have now, either. I would hope that we would maintain some sort of a loan rate and I hope that it would be a floating loan rate, based on the old Olympic average that we used to have. I would hope that we would have a better crop insurance system and with CRC, crop revenue coverage, we've moved a little bit in the direction of protecting people against both price and production disasters. But, if we're going to maintain a sound food system, we're going to have to look at some ways to provide a safety net to producers, either through a farm income support, like a better loan rate, or direct payments. I think direct payments are out of favor right now. They may come back sometime, but probably not in the rest of my farming career. But, if we're going to keep production up in this Country and

remain leaders in production, we're going to have to give farmers and their bankers an assurance that they're going to have the incomes to make the kind of investments in technology to be the continuing efficient producers that we are now, and we're not going to be able to do that in an extremely high risk environment with lower prices.

Mr. Kilman: Donna, your sector of the industry is the one that is probably going through the most tumultuous change right now--the rise of factory farms, the growing power of corporations and their interests, the rise of Murphy farms, Jack Dacosta's operation in Iowa, which I visited, Premium Standard Farms, also. IBP, I think, now contracts 40 percent of their hogs which is an enormous change in how they operated 40 years or even 10 years ago. How will small family hog farmers survive this trend and how will they change?

Ms. Reifschneider: Like all the other major agriculture sectors, the number of pork producers has declined over time and it seems that we cut that number in half every generation. Between 1950 and 1970, the number of pork producers dropped from 3.1 million to under 900,000. But during that same time, we had production increases from 79 million to 87 million hogs. And since then, the last 30 years, we have declined to about 140,000 producers and we're going to have a record 104 million head this year. Pork production has changed because it has been the most single most profitable industry of the traditional farm enterprises in the last 10 years. That fact, and the fact that the pork producers realize that we are in an information age has been the reason for the rapid rise of the larger pork operations. Pork production rewards attention to detail and information better than most any other segment of agriculture. One measure of efficiency, the amount of pork produced per breeding animal, has jumped from 1,300 pounds per head in 1964 to more than 2,500 pounds per head. But today, in many operations, instead of one operation being the site, of all phases of production, now many operations are the site of one phase--either farrowing, like our operation (we just changed over from a traditional farrow-to-finish operation to now just a farrowing operation, meaning we birth the pigs), or nurseries, or a third site, usually a finishing site. Separating these phases of production yields improvement in herd health, reduces input costs, and boosts growth efficiency. That increase in efficiency is what makes it cost-effective to have a breeding herd in North Carolina or Colorado and then ship those pigs to the Corn Belt where the corn is cheaper, and that's where the most of the slaughtering and processing plants are.

The other economic driver for larger or specialized operations is the consumer's demand for low fat, high quality pork. To produce that lean pork, we have to have specialized genetics which in turn requires specialized housing, feed, and management. This has been very effective and beneficial to consumers. These trends towards larger operations mean that about 70 percent of the hogs are produced by operations with more than 1,000 head-- about 12,000 producers. For perspective, about the same percentage of the nation's cattle, about 70 percent, are fed by less than 2,000 feeders and the consolidation figures in the poultry industry are more dramatic. The largest category of producers, 5,000 and larger, grew by about 80 people last year. The mid-sized category, 2,000 to 5,000 head, grew by 500 people. These are a lot of individuals and families who are making the jump from 300 sows to 600 sows who are starting to specialize into breeding herds, like my family, and taking advantages of the specialized facilities and some of those cost-effective means that are happening. These are the kinds of operations that make a viable career choice for the future. We've got a daughter that just came to the operation and we look to bring

another son when he graduates from college. These are the kinds of operations that will be viable long term.

Are there environmental and odor issues with these facilities? Yes, and producers of all sizes, not just large producers, need to look at the critical environmental control points on their own operation. Right now, State and Federal regulations already establish "no discharge" policy for the largest feeding operations. Our industry produces about 12 percent of all the animal manure in this Country and we as pork producers are committed to taking care of our share. We're applying the same information and technology approach to environmental management as we have in every other aspect of our industry. This is driving us toward a very efficient match-up of fertilizer nutrients with land resources. Any one who is a casual observer of our industry will recognize that policy discussion about changes in our industry often combine scientific and environmental concerns with social industry structure concerns and it is very important, I think, to realize that you can't solve one with the other. It's family operations like mine that will be hit the hardest by industry's social structure laws disguised as an environmental regulations. Believe it or not, our industry is highly mobile. Other countries want what we have because of our proven track record of profitability. Our challenge, really our new frontier in the pork industry, is keeping businesses like mine in the United States to provide a desirable value-added product in an environmentally-friendly way.

Mr. Kilman: So, your farm operation has specialized in just raising the pigs. Are you part of a network then, of other producers? Do your pigs all go to one other farm and move down through the chain?

Ms. Reifschneider: On our farm, we just farrow the pigs and they're segregated early-weaned pigs. So at 16 days of age, they go to two farms, actually, two producers who raise them.

Mr. Kilman: Is that how you think most typical hog farms are going to adjust--that they'll specialize in one area like that and network?

Ms. Reifschneider: We're seeing a lot of network coops going that way--either specializing in one end or the other and it seems to be working out well. The way we have it, it's a profit-sharing plan, so when we benefit from high prices, so do our finishers, or in these days, we all share in a little bit of the grief.

Mr. Kilman: You're from Illinois, so how long do you think it's going to be before Iowa no longer is the number one hog State? Its numbers have been falling pretty quickly--that's actually a political issue. Do you think that's going to happen?

Ms. Reifschneider: I know that there are a lot of issues going on in Iowa. There's a moratorium though in North Carolina that's limiting the growth there, so I don't see those numbers rising and that would be the number one state that would challenge Iowa, so I see Iowa still having their number one spot for quite some time. Although, those numbers are dropping also.

Mr. Kilman: I don't mean to be the "gloomy Gus," but what's going to happen with the number of hog farmers overall? If you look out 10 years from now, what do you think farmers that are your size now are going to look like?

Ms. Reifschneider: It's hard to predict what they'll look like in the future, but as farms get larger, you know we have to adapt to that. We've just made that jump in the last year to where we are happy. There's a lot of producers out there. I don't think there's one model that will just cover all the way that people raise pigs because I think we have a lot of good producers who are good managers, who know how to make money, who know how to raise pigs. I think they'll find niches--I think they'll find ways of being part of this industry and so although our numbers might decrease because of some economic issues, I still think there'll be a lot of good producers out there.

Mr. Kilman: So, Iowa's going to be number what--three or four--in 10 years?

Ms. Reifschneider: No, I wouldn't predict that. I think Iowa is going to come back to their agricultural base, realize that when they lose pork, they lose some advantages to their grain farming also and hopefully, some sense will return to some of the discussions.

Mr. Kilman: What is the solution to the hog manure situation? It's an awesome thing to be on a Premium Standard Farm operation and be surrounded by 150,000 sows, not counting their piglets. And, it's an awesome thing to be around Jack Dacosta's operations up in northwest Iowa--both of which I've been and it really is a big change for people living in the countryside. Hogs have always smelled bad--it's just a part of it. Farming is a dirty, hard business and that's just the way it is. But now it's becoming so much more concentrated. Several States are debating--actually at county levels now they're debating--how do we regulate hogs so that we can protect the quality of life for rural residents? Several States are coming up with different solutions. Several State chapters have different opinions within your organization. So, as the National President, what do you think is the solution?

Ms. Reifschneider: Well, I think if we have environmental issues and odor issues, we need to address them. In fact, at NPPC we've got several initiatives starting and going on right now to look at those problems. One initiative we have is a non-farm assessment. It's been a pilot project, but we're hoping to go Nationwide later this summer where we actually bring ag engineers and other professionals on to a farm and they do an audit or an assessment of that farm. They look at the buildings; they look at the structures; they look at ventilation; they look at air quality; they look at dead animal disposal; they look at the manure systems and the manure management plant and how that's being utilized. They give a report back to that individual producer on what kind of management improvements would improve their operation overall, but especially in the areas of odor and the environment. So, what we're saying is, we want to get right on those farms if they've got problems and straighten them out. I think we realize that we've got some problems out there and we want to be first to solve them. Another initiative we have going on is an odor initiative where we have said we will have an odor prize. We're looking for either products, technology, or management systems that would solve the odor problem. We think there are some solutions out there--maybe not in the traditional ag sectors that we've been looking at--but maybe by NASA. We've had over 200 entries come to this competition. They're

going to be evaluated this next year on the farm to see if they can reduce odor by 80 percent and hopefully, we can see some solutions to this.

Mr. Kilman: How concerned are you that the county-level movement throughout the Midwest is really going to disrupt hog farming--that you're going to see operations either shut down or move out. How big of a factor is that?

Ms. Reifschneider: I think it's very much a factor. Society is deciding right now if we will have pork operations in the States and there is no guarantee that we'll keep these operations in these States. There are other parts of the world that are looking to take that over for us. As our industry right now is in a highly emotional state and as we have people in local communities who are upset about certain things, there are a lot of decisions being made that aren't based on science, but on emotion, and I do think that's a serious problem.

Mr. Kilman: I'm not picking on you--but what's interesting about this case is that farmers often times, when they are complaining about regulations being imposed on them, say society or big city people really don't understand farming. But, this case is somewhat unique because it is neighbors--people who already live out in the countryside--who go to the HyVee store or the Eagle store.

Ms. Reifschneider: Scott, many of them are farmers. Farmers have many faces in this Country. I just spent the weekend in a meeting of farmers from around the Country with a campaign for sustainable agriculture; and we're talking about laws at the State level; about corporate farming at the county level; about size of lagoons; we're talking about Senator Harkin's bill on livestock waste management; George Miller's bill on livestock waste management. Farmers have many faces. They're concerned about the loss of control; they're concerned about size issues. Freedom to Farm does not equal freedom to all. I just want to say that.

Mr. Kilman: To me, it is interesting that your situation is so difficult to solve because it is really neighbor against neighbor as opposed to a big city-rural battle. It's not something that Congress can really solve--it's something that has to be handled at the local level.

Ms. Reifschneider: Well, those issues will be discussed and debated in the future. But, what we're experiencing in the pork industry is rapid change. Probably too rapid for people to assimilate and some of that change really frightens neighbors more than the reality of what would happen. So, I think that the pace of agricultural change is part of those concerns.

Mr. Kilman: Kathleen, I wanted to ask you two questions. One is, if the Government is going to stay involved with agriculture through some type of income support, as an environmentalist, is there a role or method that you would like to see them use?

Ms. Merrigan: Despite Freedom to Farm, our government is involved in income support and not just through direct payments. But first, a moment on the issue of payment limitations. Everyone knows that agriculture is on two tracks -- an industrialized model and alternative farming, like organic. People seem to want to help the little guys but I keep hearing from Congress and USDA: "We can't figure out how to do payment limitations; farmers always find loopholes." My

response -- we can clone Dolly; we can send a man to the moon; but we can't figure out how to do payment limitations? Come on. There are many explicit and implicit Government policies that support Earl Butz' "Get Big or Get Out" proclamation issued some years ago.

When discussing income support, let's look at the research system. It's a new era, a new frontier, and we need research to help farmers in this transition time. Well, research for whom? Are we going to use our research to try to make operations grow really big or are we going to try to help some of the small operations--organic farmers for example. The Organic Farming Research Foundation did a report looking at the USDA-supported research--some 30,000 projects in the CRIS (Current Research Information) System. They found that less than 1/10 of 1 percent was research directly pertinent to organic farmers. So I'm saying it's not just about direct income support payments.

Prior to passage of Freedom to Farm, the Wallace Institute published a report that makes the case to turn income support payments into green payments. The conservation programs we have are in large measure disguised income support programs. We've had such battles here in town about reconfiguring the CRP, so that it really does go to areas where we have the most environmental harm. When you look at the map of the United States and you look at a composite environmental benefits or harm index, such as that used in the Wallace Institute report, you see that the greatest harm from agriculture is occurring around the coastal areas. But our CRP is going right in the center of the Country. We've debated this problem in the farm bill and the debate is raging right now. The bulk of EQIP, the new consolidated conservation program in the Freedom to Farm bill, is going to Texas. These are not entirely apolitical, neutral income support or environmental support programs. We really need to decide in this new frontier, are we going to have real environmental support. Are we going to have at least size-neutral programs? Are we going to support small farmers? In the Secretary's new small farms report, *A Time To Act*, going to become reality? If we are going to continue income support payments, will they be better targeted to the environment and to small farms?

Mr. Kilman: Mr. Carlson? Mr. Kruse? Do you think the environment should be included in deciding how payments are made to farmers or some kind of support down the road? How?

Mr. Carlson: In terms of green payments, really the Freedom to Farm payments, the transition payments are in many ways green payments. To get them you have to follow the various conservation guidelines, the wetlands protection and all those things, so in some ways, they are green payments. I think that Ms. Merrigan talked about targeting or limiting payments. Certainly we had a proposal--the minority party proposal of the Senate Ag Committee provided for a targeted or a limited marketing loan. We think that was a good idea. If I could just comment on what she said about research: You know, it's ironic, and this brings me back to cooperatives. We spend public money doing research in agriculture and yet, the benefits of the research go to a relatively small group of investors in private companies who would develop a product based on that research and then market it to farmers or consumers. That, I think, is a big, big, opportunity again for cooperatives, and you know, I probably didn't mention it before, developing some of those brand new ideas like making vitamin E out of soybean oil. There are, I think, literally thousands of things we can do. With the return on farm equity of 2 percent, you wonder why we

farm. With the return on food processing or value-added companies at 14 percent you see why farmers are beginning to look at cooperatives.

Ms. Merrigan: Let me say Scott, there is little support in the American public for income payments for farmers. One ray of hope is the Dairy Compact. Ah! I've now captured the attention of the dairy guys in the audience: We were told this panel was to be run like the McLaughlin Group and, true to form, I'm taking on the role of Eleanor Clift! Anyhow, back to the Dairy Compact. The Compact is a ray of hope because people in New England have said, "We really do want to pay a higher price for milk so that we can support the small dairy farms on our landscape." However, There seems to be a reservoir of good on feeling for farmers. Perhaps its part of the romantic legacy, agrarian democracy, and all that sort of stuff, but its there and people want to support small and moderate-sized farms. And I believe there is a connection in the American public's mind about the potential environmental amenities that farmers can provide and the environmental harm they can cause. If you pollute your water, it goes down the Mississippi and you have problems in the Gulf. People are starting to make the connections and, perhaps, are willing to pay farmers for those environmental amenities on their farms. But, if the face of agriculture is predominantly big guys, big confinement facilities, and the like, I don't know what kind of future USDA has let alone income payments.

Mr. Kilman: You are one of the principal authors and thinkers on the organic standards that USDA is considering now and there's been such a big backlash against what the USDA proposed that they've had to extend the comment period. What do you object to in the USDA standards and how do you think it's finally going to wash out?

Ms. Merrigan: The comment deadline is April 30 and there's probably between 12,000 and 15,000 comments registered so far. I expect that we'll hit at least 30,000. Most of the comments have to do with USDA's potential allowance of bio-solids, irradiation, and genetic engineering. My primary objection, though, concerns control issues between USDA and the industry. When we wrote this law in 1990, the concept was that it would be a public-private partnership with shared authority between the environmental, consumer, and organic farming industries and USDA in the setting of standards. Perhaps it was devolution before its time, perhaps I was working on a Democratic staff but had some crazy Republican ideas! Unfortunately, however, the Proposed Rules usurp the authority granted to the National Organic Standards Board to determine standards in consultation with this variety of communities. This is what is at the heart of all the comments USDA is receiving.

Mr. Kilman: In particular, what is objectionable about have genetically-engineered crops be considered organic? That seems to be a real hot button in this case--is that more of a perception question or emotional question as opposed to being really grounded in science?

Ms. Merrigan: Well, I think if you were a wheat producer and your markets were threatened--I don't know if you would call that an economic problem or an emotional problem--but the fact of the matter is that there are 10,000 organic farmers in this Country. It's one of the few areas of growth in American agriculture and their customers right now do not want genetic engineering in the food. Now the industry has said and the National Organic Standards Board has said that there has not been an application of genetic engineering at this time that has been presented for

approval that we find acceptable, but no one has closed the door down the road into the future. But at this time, people don't want it and it's ironic that the one area of real growth in agriculture right now the USDA may undermine by allowing it in a proposed rule that nobody wants.

Mr. Kilman: Now, Claus, I wanted to ask you, because in Europe you folks have taken a somewhat different perspective from some other food companies or food executives that I know. It seems you're in favor of having an organic category that would not have genetically-modified organisms in it. Is that right?

Mr. Conzelmann: Well, the situation is a bit more complex, in fact, because originally, coming from scientific assessment, we said, "Why should these genetically-improved crops not be allowed in organic agriculture--especially if they could really save a lot of pesticides, which is the goal of organic agriculture"? But, then over the years, the discussion evolved and especially in Europe--I don't really know the situation so well in this Country. In Europe there are some who I would describe as more political organic farmers who wouldn't want the whole area of technology in food production, even though it could really provide some clear environmental benefits. And in Europe, the question is very much one of choice, of free choice. The feeling is that those consumers who do not want to consume any genetically-improved food, should be given the choice. So, we evolved our position a bit there and we're in discussion at the moment with the organic farming institutes in Europe to kind of strike a compromise--not to close the door forever, as you said. But because I see that biotechnology can bring substantial benefits for the environment, I wouldn't really want to close the door forever, but perhaps for a couple of years or so, until in Europe the consumer also becomes more familiar with the subject of biotechnology.

Ms. Merrigan: It is important to be clear on one thing in the Proposed Rules that the organic industry and USDA agree on: It's not that organic is safer or that genetic engineering is unsafe. Rather, organic is a production claim. It is about methods that are used to bring a product to the table which consumers want. This is a market-based standard and this is an industry that has come for help because they need a national standard. They expect industry norms to be respected. If industry norms aren't reflected in the Final rule, there is a possibility that this program could decimate the industry its designed to help.

Mr. Kruse: Scott, I think this is a perfect example of the need to use sound science in evaluating what we're talking about here, and I think it's somewhat ironic that for example in this Country, many of the most vocal opponents of genetically-altered crops are the same people who are the most vocal in opposing practically any kind of pesticide. And, yet, much of the work that has been done to this point provides an ability for a producer to grow crops with less use of pesticides by using a genetically-altered crop. It's almost as if people want it both ways and again I just think there needs to be a really objective look taken from the standpoint of sound science and we should not let emotion rule the day. I would quickly go back to a point that Donna made, and I think she's exactly right. We are making decisions so many times today in agriculture based on emotion, not on the sound science of an issue. I think we as producers are very willing, in fact anxious, to have decisions made based on sound science, but the whole issue of the emotional side of this can sometimes cause us to land on a spot that some day we may look back from and wonder what we have done to ourselves.

Mr. Kilman: I cover Monsanto and believe me, Monsanto didn't invent Round Up Ready soybeans so farmers would use less Round Up or herbicide chemicals. Maybe farmers overall will use less herbicide, but they're going to use more of Monsanto's Round Up.

Ms. Merrigan: And that allows Monsanto to essentially extend the patent-life on Round Up.

Mr. Kruse: I think Round Up Ready soybeans, for example, is a situation where farmers can use products that have been proven to be very very safe and environmentally positive and in some cases, the crops that we have developed today literally do provide resistance and tolerance to insects, so therefore there's less need for insecticides to be used. So, I think it's a combination of the two.

Mr. Carlson: Scott, I will give you a concrete example of how I think the new organic standards that USDA has proposed are in violation of the concept that producers should provide what consumers want to purchase. Our bison cooperative slaughters quite a number of bison each year. There are only 200,000 head in all of North America, so the product is limited. But, we export the highest value cuts to Belgium and we truck it from North Dakota to Chicago and then fly it to Belgium. And, we've always maintained a standard and we have a slaughter plant that has been inspected and meets the European slaughter standards, which are very high and extremely sanitary. We've always marketed that bison as hormone free because that's what the consumer wants. Not only in this Country in the restaurants where they're paying \$12 for a bison steak, but overseas where they are paying maybe \$20 and it's very lucrative for us. But, we market it as hormone free. Under these new organic standards, we're going to be forbidden from labeling this as a hormone-free product. Now, I think that we should be science based, too. I eat hormone beef and I eat genetically engineered crops--it doesn't particularly bother me. But if the consumer wants something else, why should we be discouraged from providing it? That doesn't make sense.

Mr. Kilman: I lost you--why couldn't you label it as hormone free under the proposed organic rule?

Mr. Carlson: Well, that would be the case under the USDA's proposed rules for organic products. You can't label hormone free.

Ms. Merrigan: There is a section in the Proposed Rules about labels that directly or indirectly imply a product is organic. Some of the labels discussed in this section are things like, "Ecologically Produced," "Sustainably Harvested," "Humanely Raised," "Hormone and Antibiotic Free," "Pesticide Free," and so forth. We look upon this as a potentially broad scale attack on eco-labeling experiments that are taking place at the local and State levels.

Mr. Kilman: Carrol, you've been quiet, so I'm going to ask you...

Mr. Bolen: The biotechnology industry in general and seed companies in particular have believed that we should follow this science based principle. As was stated earlier by some of the USDA officials, we believe very strongly in the position that you've got to talk about substantial equivalents and if something is substantially equivalent to something else, even though it's

developed through biotechnology, you should not have to consider it different. We believe those kinds of factors have to be taken into account. As I look specifically at organic customers, and I've been in the business of providing some products to organic customers, the principal reason for them buying, in my opinion, is their concern about health and safety of non-organic products. I would just suggest to the organic industry that we need to think more long term, where is this really going to go, and is biotechnology going to be able to deliver products that are substantially better for health and nutrition? If we take a position today that organic products cannot be developed through genetic engineering, we're going to be denying those customers of one of the very things that they're buying organic products for. Now, I agree that the organic producers have a right to be concerned somewhat right now while this technology is being understood, but I think that's a timing issue and I think as we look 3 to 5 years out, most of this is going to be behind us. And, if I were an organic producer, by that time I would want to be able to be growing transgenic products that could be certified as organic. So, I think we have to be careful about taking a position today that will hurt the organic growers and the consumers 3 to 5 years out.

Mr. Kilman: I want to talk about biotechnology, but I want to shift a little bit, Carrol. How do you think biotechnology is going to change the way farmers actually operate, beyond the fact that they're planting different kinds of seeds now such as Round Up Ready soybeans. Your company in conjunction with DuPont has a strategic plan of coordinating the growing of these crops for customer food companies. I think once you folks were saying that in not many years you hope to contract for the growth of 10 million acres of crops with output traits such as "high lysine corn" or "high mythionine."

Mr. Bolen: That's correct, Scott. The first generation of products that have grown so quickly are what we call "input traits" that either add to productivity or cut the cost of production. The second wave of ag biotechnology is going to be the "quality traits," or the "end user traits." I really believe that the greatest opportunity is on the output side, and that is where we are going to change the grains themselves to make them better suited for what they are used for. That's for food, for feed, for industrial purposes, and yes, we will make them more environmentally friendly. Secretary Glickman gave one example of that this morning when he talked about the low phytic acid corn that will cut the phosphorus in manure by some 40 percent. There are lots of products like that being worked on. Most of corn and soybeans are used as a feed crop, so many companies, including ourselves, are concentrating on how you make corn and soybeans better feed--a better balance of amino acids, for example--so that you don't have to supplement with as much amino acids or protein meal. As a side benefit, if you can give a better balance of amino acids, you will have less nitrogen in the manure. So not only do we have what Secretary Glickman was talking about this morning in terms of lower phosphorus in the manure, but you can have also lower nitrogen and these are the two major contaminants in our ground water caused by agriculture.

On the health side, as we look as soybeans, you can produce healthier soybean products at the same time producing a higher valued meal for the livestock industry. We have on the market place today low-saturate soybean oil, and we're just starting to market high oleic soybeans, both through our joint venture with Dupont Optimum Quality Grains LLC. Both of these have lower

saturated fat contents. They're healthier products. All of these are going to require an identity-preserved system for delivery to the marketplace.

We've heard a number of comments here this morning about what we can do to support smaller farmers and not just continue to drive everything larger. I think biotechnology provides a great opportunity to do exactly what Robert here said about providing the foundation for a lot of these cooperatives--value-added cooperatives. They can take the products coming out of biotechnology, put them in a combination of small farmers, or larger farmers, or however they want to do. I happened to serve on Secretary Glickman's Small Farms Commission, and I heard lots of testimony about what USDA needs to do and how the small farmer has been discriminated against. One of the greatest things that I think can happen to them is the use of biotechnology production of value-added products that can be marketed through cooperatives. But, it will take a much more integrated system and we all need to understand that. Some people are opposed to the vertically integrated systems but really to capture the value and deliver it on to the consumer--to deliver them the products that they really want--it is going to take a more integrated system than what we have today and cooperatives can help to do that.

Mr. Kilman: Europe has taken a different position on genetically-modified organisms in food. In the United States, a food company is not required to label their food as having GMO's in it--indeed it's even hard for a food company to label a product saying it doesn't have GMO's in it. Europe is moving toward the labeling of food for that presence, and indeed, Nestle was one of the first, if not the first, company that do that broadly. Why did Nestle decide to label genetically modified organisms and why do you think it's a good idea?

Mr. Conzelmann: From the food industry's perspective, it is a big problem that the first generation of crops were typically the agricultural input traits and not the quality output traits that really give a better product for the consumer. We had a great deal of difficulty explaining to European consumers why they should now accept genetically modified crops or ingredients from modified crops grown by U.S. agriculture, because, really, the advantages were and still are very much confined to this Country where we have just seen how impressive an acreage is already growing. That really led to some resistance. People said, "Well, we can't really stop it." These really huge quantities have taken on such momentum, so that the consumers said, "At least we want the right to choose." And, of course, we were also coming in the 1980's from a science-based approach saying there is absolutely no scientific or safety reason for specifically labeling these products. In fact, we defined our own corporate policies 3 years before the FDA essentially came up with the same kind of arguments. But, then we realized in Europe, that also due to a lack of communication, those on the side of the biotech companies and also the food companies that we simply didn't get the message across to fight off this kind of labeling issue. It was a bit like passing the buck. The U. S. biotech and seed companies thought, "We are selling to the U.S. farmer; why should we invest in public communication and information program for European consumers? We don't really sell to them." We in the food industry in Europe said, "We don't have any direct competitive advantages--as a food industry, or as a food company, so why should we spend our well-earned money in order really to make publicity for the U.S. biotech companies"? This way, the buck was passed too long. It is now starting to change because everyone has realized that we are all sitting in the same boat. Our food industry can't make any products without ingredients, without raw materials. We saw that labeling issues would become inevitable,

which was about 18 months ago, and it is now mandatory since first of November of last year. Rather than trying to be defensive, we said, "These products have so many advantages. Let's try to turn it around and make a virtue out of necessity and communicate all the positive aspects of these products, especially positive environmental aspects, leaving the choice to the consumers. We've seen not only our company but also all the other companies, like Unilever, and others like Zenica and Calgene in this country who have labeled products, didn't suffer any negative sales impact. I think it's much over-estimated.

Mr. Kilman: So, you haven't seen any fallout?

Mr. Conzelmann: Certainly not with consumers, because we really see the biotech label as the seal of quality. The biggest problem is in some European countries, particularly in Austria and Switzerland, which happen to be the countries worldwide with the highest percentages of organic agriculture. In fact, on average in Europe, I think, less than 1 percent of the food is organically produced, whereas in Switzerland and Austria it is about 7 to 8 percent. These countries tend to be much more conscious of these kinds of issues. Switzerland also has a direct democracy. There will be a vote, in fact, a popular referendum, on whether or not to allow biotechnology in Switzerland. So, we have totally different kind of stakes there.

Mr. Kilman: I want to make sure I understand one thing. If genetically engineered organisms are banned from organic food, do you think that will close the door on some important uses for biotechnology down the road?

Mr. Conzelmann: Well, certainly not close the door because, as I said, organic agriculture in Europe averages about 1 percent of products grown. So, we would rather bet on the other 99 percent of the market and say that these products really are improved with this new technology. They give a better product--more environmentally sustainable--and also requiring less pesticides. Another reason for doing that is that we hope that a second generation of products will soon come to the market which we would hope to develop in very close cooperation with companies like Pioneer. These products would have perceptible and tangible consumer benefits like more nutritional value.

Mr. Kilman: So, would you recommend that U.S. companies label their foods? Do you think that would be a wise marketing strategy?

Mr. Conzelmann: Food is, even more than other products, very much culturally dependent. For example, for our key product, Nescafe, we sell about 100 different types. The one we sell in Germany is different from the one in France and definitely different from the one we sell in this Country. So, there are marketing strategies. If the consumer wants labeling, then we consider it. But so far, in this Country, we don't really feel a big consumer demand for labeling. I think Nestle USA has had not even a dozen requests for further information on which products are genetically modified or not.

Mr. Kilman: Are there any questions from the audience?

Question: I have a question for the panel. I think everyone on the panel has said the phrase “sound science” and I wanted someone to define “sound science”--when often times scientific studies are paid for by the interest groups on whichever side of the spectrum and if the consumer is really the first step on the food chain, should the consumer know who is paying for scientific studies that are the basis of decisions about the food supply?

Mr. Bolen: Let me say, first of all, that I compliment our Government for what I think is the proper balance between protecting the consumers’ interest and not over-regulating the technology. Having said that, to deliver products to the marketplace, we must go through USDA, EPA, and FDA. All of those organizations define what needs to happen to get products approved. I can assure you that there is a very tough regulatory process in place. If you’re modifying a protein, then the Government is going to require you to run certain types of tests--feeding trials, or whatever--before you get your product approved. It varies depending on the type of product, but it is all based upon that general category of sound science as defined by our Government.

Ms. Merrigan: Let me just say that the Wallace Institute, and Kathleen Merrigan, for what it’s worth, are very excited about the promise of biotechnology. We’re not against it at all but we want to raise tough questions and your question about “sound science”, I think, is an important one. In a time of dwindling research budgets which we’ve heard some about already today, our land grant university system and other research universities are becoming more dependent on industry financing for their programs, which is problematic. Let me relate to you an experience I had when I worked on the Senate Agriculture Committee for then-Chairman Patrick Leahy and bovine somatotropin, as you might recall, was a bit of an issue. When we were trying to find experts to help GAO evaluate problems of antibiotic residues in milk and bovine somatotropin, we found it almost impossible to find someone in the university system that hadn’t, sometime in their career, been on the industry payroll. That presented a very big public acceptance problem in terms of “sound science” and fair or not, in terms of the credibility of that source. So, not only do we need more money in our research institutions, but we really need to set up some fire walls between public-based and private-based research.

Mr. Conzelmann: Another very important issue here is international: who actually defines “sound science.” If FDA, USDA, and EPA say it is safe, must this product automatically be accepted by the rest of the world? We especially have the problem at the moment in Europe that the regulatory system is lagging behind the main producing country--the United States. Not only agricultural products, but even finished food products we produce here with U.S. grown corn, cannot be sold at the moment for example in the European Union and in some other parts of the world, simply because the different regulatory systems are not harmonized. Therefore, I would like to propose the need to reflect on a mechanism which really defines “sound science” and which evaluates these products once globally. This could be done, for example, under the umbrella of the World Trade Organization together with the World Health Organization and the Food and Agriculture Organization, as it’s already done in others areas like food additives. Once a product would be cleared as safe by this internationally very balanced panel, there shouldn’t be any trade barriers to import it world-wide.

Ms. Reifschneider: I find it very odd that a lot of people ask the questions of industry saying you have this problem, you have this concern, solve it. Then we go to researchers and fund their

research. There are limited researchers in this country who can solve certain specific scientific problems and we question their reputation and their scientific results. Although I do think the science debate is very healthy and should continue, and we should have multiple sources when we try to solve the science issue, we are the ones who are trying to come forward and say these are the issues that are important to agriculture. Please help us solve this for the greater good.

Mr. Kruse: I think it's very unfortunate today that some folks, anyway, immediately tag anyone involved with industry or anyone who has ever been involved with industry, as somehow being totally disingenuous, totally dishonest, and as having an agenda. Granted, there are those out there that may well be that way, but I think it's not doing us, as a society, any favor whatsoever to do that. I think it's just as wrong for the other side of this issue for people to stand up and speak authoritatively on something based on emotion, rather than on any expertise they may have. The whole issue of GMO's that we spent quite a bit of time talking about this morning is a perfect example. Norman Borlaug, for example, mentioned this morning, is one of the premier plant breeders in the world. I dare say you could get a group of the most distinguished blue ribbon panel of plant breeders together and they would very quickly say that there is no difference in what we're doing biotechnologically today and what we have done traditionally in plant breeding for years and years. And yet, we have this big argument going on that I think does a great disservice to all of us in agriculture. That's to me one example among many, when we talk about using "sound science."

Question: I've heard so much about emotion and I'd just like to remind everybody on the panel something that most people in the room know. Most people who are farming are farming very much because of emotion. I think emotion is fine and I would say let's get comfortable with it. I would also say to Ms. Reifschneider, and I think I have this quoted correctly, her saying "It's family operations like mine that will be hit by industry social structure laws that are disguised as environmental regulations." Now, I don't blame you, Ma'am, for being upset about some confusion about the motives for these things and yes, it's wrong to disguise social structure laws as environmental regulations, but I contend that you really would be well-advised to examine why there are concerns about social structure among both farmers and consumers. I'm dismayed that we're not hearing more from consumers about their concern for family farmers. But, I'll tell you something else--I think we're very soon going to learn a lot more about consumers' preference for family farm agriculture. Those folks who have chosen a very high tech, very industrial based agriculture, I really think you're heading on a path that may be much shorter than most of you think. My name is Don Deichman and yes, I'm running for office. I'm running for Congress in the Democratic Primary in Montgomery County, Maryland, if anybody wants to talk to me.

Ms. Reifschneider: If I could respond--I appreciate your comments and I know there's quite a debate in Congress and in different States about these emotional issues. When we're talking about social structure issues disguised as environmental regulations, I think one that I can talk about is in South Dakota. In some areas, they have 4-mile setbacks for hog operations. That certainly is very exclusive when you have those kinds of setbacks and makes it very difficult for operations like mine or other operations to be part of this industry. And, when we have rules and regulations based on those kinds of ordinances to exclude the pork industry, rather to include the industry, they're meant for a certain group of producers or certain size of producers, but's uncanny how those rules and regulations seem to filter down and affect the middle or the smaller

producer. So, although you try to protect a size, overall you in fact, you do a disservice to the smaller sizes. But, I appreciate your comments.

Question: This question should begin with Mr. Conzelmann. If biotechnology proceeds at its current rapid pace, and let's assume 5 to 10 years hence, we find that in Europe you have 98 percent of your foods containing GMO's and every food has on its label, "Contains GMO," what real advantage then do you have by having everything label GMO?

Mr. Conzelmann: That's an issue we debated very long. The problem is to get from the point where no GMO products are on the market to a point where everything is GMO. And, in order to facilitate this market introduction we concluded that we just had to reassure the public that a company like ours, with all our positive image, would respond to their concerns. But, I'm absolutely convinced that the same consumer organizations that are today asking for these labels, in 3 to 5 years at the latest, will tell us, "Stop the nonsense because it's on every product." That's the approach we're taking to make the consumer familiar with a product, and in this Country, it was done on a voluntary basis with the Flavor Saver Tomato. Then once consumers became familiar, then they accepted it and in 5 years they will probably accept it without a label.

Ms. Merrigan: At this end of the table, we're actually saying the same thing and it is that age-old adage, "The customer is always right." If consumers want to know and there are market reasons for letting them know, then they have a right to know. If and when we get to the time when people no longer care for that label, there'll be no reason to have that label. But right now, people want to know and I think it is unfair not to give them the information they demand.

THE COOPERATIVE RENAISSANCE: EMPOWERING PRODUCERS IN AN ERA OF GREATER RISK

by
Robert Carlson
President, North Dakota Farmers Union

Background

Farmers' interest in forming new processing cooperatives began in earnest in the early 1990s spurred by several developments that threatened traditional operating methods. Low commodity prices and the prospects for reduced federal farm program support turned producers' attention toward new ventures as an economic survival response. New trade agreements increased competition and threatened to reduce prices for wheat and livestock producers. Meanwhile, vertically-integrated corporations were expanding factory-style farms in poultry, hog and potato production.

It became evident to the members and leadership of National Farmers Union and its affiliated state organizations that family farmers and ranchers would need a self-help strategy to diversify and stabilize their income. A key element of the strategy is to foster the development of farmer-owned enterprises that allow the producers of raw agricultural commodities to gain the economic benefit of processing, wholesaling or retailing a food item.

North Dakota and Minnesota farmers originated the cooperative renaissance and were well suited to lead it. Northern Plains farmers have a strong cooperative heritage and are familiar with cooperative businesses. In addition, the high risk of production agriculture on the arid plains demands that producers have a safety net or some other income to cushion steep drops in production or prices. The phenomenal success of the Crystal Sugar Cooperative in the Red River Valley provided a positive example of what value-added processing could do for farm income. Finally, the North Dakota Legislature established a fund called the Agricultural Products Utilization Commission to help finance feasibility studies of various new ideas. Although most of those

ideas did not go beyond the study stage because they did not offer enough financial reward to justify the farmers' investment risk, some bore fruit.

Cooperative Advantages

Several new cooperatives that began operating in the mid-1990s are very successful. They include the Dakota Growers Pasta Company, the North American Bison Cooperative and two hog farrowing cooperatives. Two major corn processing cooperatives have recently formed alliances with private companies.

It is difficult to make accurate generalizations about these new cooperatives. But there are some unique advantages that the successful processing cooperatives have in common. Perhaps the most important advantage is improved quality control because of the relationship of the producer-owner to the processor. The producer provides the product and the identity of the raw commodity can be preserved right through to the final processed product. The producers take pride in their product and that motivates them to provide the best quality commodity to their new cooperative. But perhaps more importantly, the producer is under contract to provide a specific quantity and quality to the processor. This identity-preserved connection from producer to finished product is unique to farmer-owned cooperatives and it is often envied by private industry.

Quality control advantages enable cooperatives to fill the niches in a huge consumer food market of over \$705 billion. In this huge market, compare the return on equity between farmers and food companies. The farm value of raw commodities has not changed much since 1970, but the retail value of food has multiplied.

The average US farmer's return on equity is 2%; for US food companies it is 14%. Given these economic returns, it is not surprising that farmers are beginning to recognize the great opportunities in value-added agriculture.

The owners of the new cooperatives are farmers who recognize that the food business does not begin with what they produce. Rather, it begins with what consumers choose to purchase. These consumers are demanding new products, greater variety and more choices. There are around 15,000 new food products introduced in the US each year. Many fail, but the point is that the food industry is a very large and dynamic market that offers potential for new cooperative ventures if they can be capitalized and managed and marketed successfully.

A 1996 North Dakota State University study comparing farmer-investors and non-investors in new cooperatives found that the investors were motivated by the desire to increase farm income, reduce marketing risk, gain access to value-added markets, and gain a consistent market outlet. The investors were also, on average, younger, more educated, farmed more land, and had more assets and debts than the non-investors.

Success or Failure

The new cooperatives need five essential elements for success. The seed is the idea for a venture that is bigger than the individual can undertake alone. The idea then needs to be studied carefully and dispassionately by the most competent firm one can employ. The most critical questions to answer in the study are: Where is the market, where are the members and what is the probable return on equity?

The greatest challenge is to find enough farmer-investors to adequately capitalize the new cooperative. These are generally farmers who are willing to take a new risk and who have some understanding of cooperative business. Lenders are nearly always required, and, if they are experienced cooperative business lenders, their advice and counsel can be tremendously valuable to the new venture. USDA cooperative development grants and loans, such as those delivered through the Rural Electric and Telephone Cooperatives, are important aids in the struggle to adequately capitalize a new cooperative. Rural Development Agency grants to value-added cooperative initiatives have enabled several new farmer-owned ventures to begin formative steps.

Finally, the new cooperative needs talented management with the ability to run a business wisely and efficiently, as well as the ability to communicate with the farmer-owners and the board of directors. That often involves an element of luck in the selection of the general manager or CEO. If the business is not adequately capitalized to sustain two or three years of initial operating losses, then the co-op is dangerously vulnerable to failure.

Self-Empowerment through Cooperatives

The future for farmers and ranchers certainly appears to hold greater risk. If our future lies in being the world's lowest cost producers by reducing our production costs and by becoming more competitive – a euphemism used in agriculture to mean lower-priced commodities – then our future is rather bleak. A much more appealing and productive vision lies not in lowering ourselves to world agriculture's lowest common

denominator, but in finding new ways to diversify and stabilize family farm income so that producers can weather the volatile commodity prices that will accompany the so-called market-driven farm economy.

The value-added cooperative vision for agricultural producers also involves risk, but it is a risk that the farmer can control by determining their level of investment. More importantly, it is a financial risk that offers a reward in annual family income and in an improved asset section of the balance sheet. When new processing facilities are located in rural communities, there is additional value added through new jobs.

Farmers have always built cooperative businesses to gain an economic advantage for themselves. They feel the need to try to take greater control over the economic forces that impact their income and expenses and their lives. Farmers today face greater exposure to variables in prices and production; we are more vulnerable financially than we were in the recent past. The new cooperatives represent the best in self-help initiatives to empower our agricultural producers in the 21st century.

Panel: "New Frontiers for Agricultural Exports"

Remarks

Lon Hatamiya

Administrator of the Foreign Agricultural Service
USDA

Good afternoon, ladies and gentlemen. Thank you for joining us. I am Lon Hatamiya, Administrator of USDA's Foreign Agricultural Service, and I will be this panel's moderator.

The topic for this afternoon's panel discussion -- "New Frontiers for Agricultural Exports" -- could not be more appropriate for the changes we have seen in the business world over the past six months.

I suggest we look at the "new frontiers" that lie ahead from three different vantage points:

- New ways of doing business
- New products
- New markets

New Ways of Doing Business

If the events of the past six months have taught us anything, it is that the old financial order is facing a new reality. I returned just a few weeks ago from a seven-nation fact finding tour of Asia with Under Secretary Gus Schumacher and our General Sales Manager, Chris Goldthwait. While the effect of the Asian financial crisis on U.S. agricultural exports varies from country to country and from mild (such as in Japan) to moderate (such as in Korea and Thailand) to severe (such as in Indonesia), there is one common thread: we must adjust our ways of doing business to respond to our changing markets.

Let me give you just a few examples. As a result of our trip, we are exploring several options to keep the flow of U.S. agricultural exports to Asia moving. These include increasing our \$1-billion GSM-102 export credit guarantees to Korea; increasing the promotion and use of our Supplier Credit Guarantee Program to support exports of high-value products, which will be the hardest hit category of sales to Asia; possible extension of Public Law 480 Title I to Indonesia, which is the hardest hit of the economies; technical seminars for bankers and importers on our GSM-102 program to create more interest in the program and make it available to a wider variety of users; and intensifying our market development efforts. This is particularly important for maintaining a presence in these markets, even for products that may see a downturn in sales in the short term.

New Products

Key to any discussion of new frontiers in agricultural exporting is looking at new products. Let me give you just one example -- the products of biotechnology. These products hold the most promise and peril of any of our exports. As we look for answers to world food security, biotech products

are surely at the top of the list of answers. They have the potential to increase food production dramatically in an environmentally sustainable way. Biotechnology can help us produce more crops from the same land base, crops with more nutrition, crops that require less water and pesticides. As long as science proves these products safe -- which it has time and time again -- we cannot in good conscience turn our backs on them. But for some countries, biotech products are lightning rods for protectionism, misinformation, and fear. Our challenge is to educate consumers, producers, and our trading partners about these products' potential and promise. Because of the importance that biotechnology plays in new agricultural products, USDA recently established a Department-wide working group on biotechnology that will coordinate USDA's efforts in this area.

New Markets

Changes in many of the world's economies mean we essentially are looking at some new markets for our products. For example, the market-opening measures that will result from International Monetary Fund-led reforms in several Asian countries mean that U.S. exports have a chance to get into markets that were previously closed or severely restricted. In Korea, the IMF agreement requires Korea to move toward trade liberalization, a move that would resolve several longstanding problems for the United States. In January, Korea began to harmonize its standards with international codes, which will increase access for U.S. exporters. Korea has revised pesticide tolerance levels in harmonization with CODEX, which should allow U.S. fresh fruit to enter Korea unimpeded. Under the IMF agreement, Korea agreed to address the problem of import licensing. Elimination of restrictive licensing will provide Korean food industries with needed inputs at lower prices and could lead to the solution of a number of longstanding access problems for U.S. exporters of such items as corn grits, soyflakes, and peanuts.

In Indonesia, the government is pledged to abolish a dozen officially sanctioned monopolies that have dominated whole parts of the economy for decades -- including every pad of paper sold in the country, every piece of timber, and every sack of flour. The lifting of BULOG's monopoly of wheat imports and wheat flour distribution could increase exports of U.S. wheat to this market.

Not to dwell entirely on Asia, we can see new markets in other parts of the world. For example, in Africa, President Clinton's recently announced partnership with Africa will further support the reform process there, expanding trade and investment in a region that was long neglected by exporters. It represents a new start toward moving our relationship toward one based on commercial rather than concessional trade.

Introduction of First Speaker (Asia):

But enough from the government's point of view. Let's turn to our panel's speakers to hear their views on where the opportunities lie for U.S. exporters.

Let me explain how we will proceed. I will introduce each panelist. Following their presentations, I will open the floor to questions. I look forward to some challenging questions so we can generate a stimulating and informative discussion.

First we'll look at Asia, which accounts for just over one-fourth of global agricultural imports. Nearly 20 years ago, Asia replaced Western Europe as the leading regional market for U.S. agricultural products. Since then, U.S. exports to this region have steadily increased, reaching a record-high of \$26.4 billion in fiscal year 1996. Despite the financial crisis now unfolding in some Asian countries and slower economic growth in Japan, Asia is still expected to offer the greatest opportunity for new sales as we begin the new millennium.

Our first speaker is Michael Wootton, Director of Federal Government Affairs with Sunkist Growers, who will speak about "Opportunities in Asia."

Mr. Wootton has extensive experience in matters of trade, particularly trade with a focus toward Asia. He spent 24 years working behind the scenes on Capitol Hill in the offices of the four Congressmen and two Senators -- all Californians. Earlier, he served as District Director of the International Trade Administration with the U.S. Department of Commerce in San Diego. Mr. Wootton is a graduate of the University of San Francisco, where he also did graduate work in International Relations.

Please join me in welcoming Michael Wootton.

Introduction of Second Speaker (Africa):

Africa is undergoing a transformation and we are encouraged by many of the economic and trade policy developments we are seeing there. The United States has a significant stake in Africa. In terms of agricultural trade, U.S. exports to Sub-Saharan Africa, including food aid, have ranged from \$800 million to \$1.1 billion in recent years. Despite the progress we are seeing, political turmoil, government economic policies, and the greater attractiveness of other locations for foreign investment capital continue to hamper economic progress in the region.

But there are encouraging signs. In South Africa, the fall of apartheid has meant that 35 million people (making up about 85 percent of the population), which were once restricted from freely participating in the economy, now have many new opportunities before them. A rise in the black middle-class can be expected in the medium to long term. Outside South Africa, most countries are still dealing with the adaptation of market-driven economic policies that could raise the standard of living. Later this week, Secretary Glickman will be accompanying Vice President Gore to South Africa for the Binational Commission meetings, so I am looking forward to hearing from our next speaker, who will discuss the opportunities that lie ahead in Africa.

Our next panelist is Bonnie Raquet, Vice President for Washington Corporate Relations with Cargill. Ms. Raquet has had a varied and distinguished career with Cargill, including working at its headquarters in Minneapolis and its office in Geneva, Switzerland. In her current position with Cargill, she directs Federal government relations, and business and rural development efforts. No stranger to trade disputes, Ms. Raquet has also practiced international trade and maritime law. A graduate of Valparaiso University, she holds a master's degree from Cleveland State University and a J.D. from the University of Minnesota Law School. Please welcome Bonnie Raquet.

Introduction of Third Speaker (Eastern Europe):

With all the buzz about the potential of and problems in Asia, we must keep in perspective that Asia is only PART of the export story. While sales are not as large or glamorous as to other regions, Eastern Europe remains a viable market, albeit one that requires perhaps the largest amount of effort per dollar of sales. Eastern Europe accounts for less than 5 percent of global agricultural imports. Our own agricultural exports to this region have remained flat since the breakup of the Former Soviet Union and average \$300-\$400 million each year. Despite an additional amount of sales from transshipments via European Union (EU) countries, total U.S. agricultural exports to this region account for no more than 1 percent of U.S. sales worldwide.

Economic reform, the EU integration process, and rapid economic growth will remain the order of the day in Eastern Europe over the next several years. The EU and the countries of the Former Soviet Union dominate trade with this region. Inter-regional trade within Europe also remains very important. Regarding the U.S.-Eastern Europe trading relationship, the United States is a major supplier of poultry meat, as well as some cotton, soybeans, and corn.

Our final speaker is Jeffrey Beard, Director of Central European Operations for Pioneer Hi-Bred, International in Vienna, Austria. He has been with Pioneer since 1985, and has worked in its Paris office as well. He is uniquely qualified to tell us where the opportunities are in Eastern Europe, having headed Pioneer's Vienna office since 1993. Before that, Mr. Beard worked for Proctor and Gamble. He holds an undergraduate degree in analytical management from the U.S. Naval Academy in Annapolis, an MBA degree from the University of Wisconsin, and a master's in agribusiness from Iowa State University. Please help me welcome Jeffrey Beard.

Asia Market Presentation

Michael Wootton
Director, Federal Government Affairs
Sunkist Growers - Washington, D.C.

When the folks at USDA first asked me to serve as a panelist today and talk to you about Asia markets, I felt both flattered and somewhat intimidated, assuming most people in this audience probably enjoy more Asia experience than I have, but I was able to draw from our Sunkist marketing people who have extensive experience operating in those markets to help me prepare my remarks. So today, I hope you find your time well spent.

I'd like to first make some general observations about Asian markets, some common issues in the trade , and then talk about individual country markets.

While there has been a great deal of talk and media coverage about the "Asian Economic Crisis," in fact, the American citrus industry has been much more severely damaged to date by the winter storms of El Nino than anything dished out to us by Asian economic disruptions. That is not to say we have been unaffected by the recent economic turn of events in S.E. Asia, but I think we need to keep it in perspective and not be overwhelmed by it.

Some Background ...

With the economic boom occurring in Asia over the past decade or more, American agricultural trade substantially gravitated and increased to that part of the world.

The Southeast Asian economies - Indonesia, Thailand, Malaysia, Philippines and South Korea - have in recent times consumed 12 % of American agricultural exports. With their currencies recently devaluated anywhere from 40 to 80 %, the impact on this consumption is already in evidence and could become more pronounced. Particularly as needed belt tightening and financial reforms are seriously implemented by the respective governments in response to the demands of the International Monetary Fund (IMF) and the world's major financial institutions. U.S. agricultural exports to these affected countries is projected by USDA economists to decline \$500 million in 1998.

The response of these governments. as you probably have read, varies greatly - Korea seems intent upon undertaking actions that will lead to a quick and strong recovery; Malaysia appears to be taking appropriate action but Indonesia under President Suharto seems still resistant to real reform necessary. Thailand is somewhere in between but heading in the right direction.

What is likely to happen in the coming months? Expert opinion ranges from "we've already seen the worst of it" to "the effect will be minimal on the U.S." to much more dramatically negative "crisis" descriptions.

Markets like Malaysia, Thailand, Indonesia are new and developing markets for us, along with Vietnam. The economic crunch has impacted our sales in these areas. Before the recent events, Malaysia was our fastest growing market in the world; Indonesia was increasing the size and frequency of its orders in our first year in that market; Thailand was becoming a steady customer. Even Vietnam was promising with some small orders.

While some of these markets, might recover fairly quickly - within the next 12 to 18 months, some may take longer depending upon how serious they are in implementing fiscal reforms.

To date, the \$34 billion financial assistance package from the IMF and such measures as USDA's \$2 billion export credit guarantee/ GSM program have, in the short term, helped mitigate the effect of this downturn on American agricultural imports. However, if the economic problem continues longer term (meaning two years plus) USDA predicts a decline of American agricultural exports worldwide by 3 to 6 %. The combination of currency devaluation against the dollar and reduced consumer demand could significantly impact agricultural exports to the region.

Given the financial and economic interdependence of the region, the problems of the Tigers of Southeast Asia will perhaps have some negative impact on Japan, where economic conditions are fairly stable and possibly will be even further strengthened by the new banking reforms and stabilization package just approved by the Japanese Diet. (\$238 billion) Additionally, the Japanese government is likely to embark upon an effort to stimulate the economy later this year. However, USDA projects American agricultural exports to Japan could decline by as much as 2 % (\$200 million) in 1998 and prices are likely to be lower given the reduced demand and generally lower prices throughout Asia.

Decline in value of domestic currencies against the U.S. dollar make our products more expensive for those Asian consumers creating an opportunity for similar but cheaper products from lower production cost competitors - notably Southern Hemisphere producers - seeking to displace us in those markets. We need to think of market position not in the short term which can be addressed to some extent by IMF and USDA's GSM help but for the longer term. The growth rate and developmental momentum in that part of the world is too great to give up on too quickly. The Pacific Rim - despite the current (and we believe temporary) economic woes - continues to offer great long term markets of opportunity.

But this story is just playing out... our perceptions about the matter are mostly anecdotal - with some industries seeing decline in individual orders from different Asian markets. We have been through these economic downturns previously and some experts seem to think it could take up to two (2) years for these economies to recover, but recover they will. Our thinking and strategy, while mindful of short term needs, therefore must be designed for the longer haul. For American agricultural exporters like Sunkist, who have for a long time been nurturing and developing those markets, we have too much invested and have too much confidence in those countries to prompt redirection of our attention elsewhere. The market growth potential is too great to be denied over time.

As I've said, from Sunkist perspective, at least based upon the last few months, we have been hurt much more by El Nino storms in California and Arizona than by Asian economic problems. Except for some decline in small, fledgling markets like Indonesia, Malaysia, and Thailand, our sales in Asia have been pretty much on track. In fact, we have more orders coming out of Asia than fruit to fill them because of El Nino. USDA reports high value horticultural product sales actually increased the last quarter of '97 in Hong Kong and Taiwan. We've not experienced decline in our Korean market where our sales continue on track with a slight increase.

If - acting through and with the cooperation of our government - we could affect favorable improvements in those countries import policies, namely reducing the existing tariff rates, the currency devaluations could to some degree be mitigated in terms of competitive pricing palatable to those hard pressed consumers. For example, if we were to enjoy a 5 % instead of a 50 % or 89 % tariff in Korea on our oranges; a 5 % instead of a 51 % duty in Thailand on our fresh citrus fruit; a 5 % instead of 38 % on our navel oranges in Japan,; a 5% instead of a 40% tariff on oranges in Taiwan - we could better price our fruit for those consumers and still make the needed margin for the transaction to be worthwhile.

That's why Secretary Glickman's opening remarks today is music to our ears - we very much appreciate his focus on those tariff rates.

We have experienced growing use of sanitary and phytosanitary regulations and claims as the new and preferred tools of protectionism by those interested in creating obstacles to trade.

- the use of inordinately low and scientifically unjustified maximum pesticide residue tolerances used to obstruct citrus fruit shipments into Korea from California... describe how our government aggressively intervened and now problem being solved...
- the use of expansive quarantine standards by Australia and New Zealand and periodically flirted with by Korea to restrict the fruit eligible for export from the U.S. to their markets...
- ongoing efforts by trading partners to impose new and onerous requirements for attestation on government phytosanitary certifications which must accompany fresh fruit shipments from the U.S., eg. re. types, volumes, dates of application and identification of specific groves, for pesticide use; additional labeling requirements, etc.

To address these matters with our Asian trading partners, we have urged our government to go back to the SPS Agreement of the Uruguay Round. Engage in aggressive enforcement of its provisions -- the need for sound science to be the foundation for any SPS requirements; greater adherence to internationally accepted standards, norms and practices to achieve the stated goal of harmonization. These are obligations of WTO membership which must be constantly emphasized in discussions with our trading partners. The response received from USTR and USDA has been very positive as exemplified by Deputy Under Secretary Gus Schumacher's comments at today's opening session.

We need to further strengthen international standards set forth by Codex Alimentarius Commission, the IPPC and IOE. It is far easier to get our trading partners to comply with policies that are identified and recognized as "international standards" than demand their compliance with US standards.

In this regard, we would urge the USDA to place greater emphasis on programs aimed at sharing scientific research and data upon which our SPS policies are based with our trading partners. It is hoped that through such information sharing, science based policies of SPS regulations, quarantine requirements, food safety, etc. will gain widespread acceptance

Let's take a quick look at some of the key country markets ---

SOUTH KOREA -

- a very important and growing market where we've not experienced a decline in sales this year;
 - but one not easily developed - requires a great deal of work to overcome some institutional problems that dictate against competition -
1. The Tariff Rate Quota or TRQ - that restricts the volume of imported citrus into Korean markets (this is something Secretary Schumacher mentioned earlier today) - last year set at 25,000 MT and increased slightly each year. However purchases are low bid based/. This precludes advertising and market promotion since we can sell only limited volumes and for lowest prices. You can not generate more sales and improve prices by advertising under these conditions.
 2. Tariff rates on citrus both within and outside the quota are very high - 50% within the quota and 89 % outside the quota
 3. the import program has been turned over to the Cheju citrus growers association to administer. So our Korean competitors control all imports of citrus.

As I earlier noted, we have experienced the use of SPS regulations to restrict the trade. However when our government aggressively asserted our rights and their (Korea's) obligations under the SPS agreement and noted Korean policy was at significant variance with international standards (Codex) to their credit, Korea responded and moved to bring their standards into Codex conformity.

Concerning the economic downturn in Korea, most food industry officials in Korea believe the IMF-mandated reforms are necessary to restore fiscal integrity. And we see the Korean government implementing action. The expectation is that the recovery will be rapid and strong.

It is similarly a strongly held view that the earlier government and media led frugality campaign was a mistake that could actually compound the economic difficulty by encouraging people not to spend. That seems to have been laid to rest. President-elect Kim Day Jung said "If a product is good, whether made in Korea or overseas, a desirable pattern of consumption is good and will make it easier to overcome the recession..." (Asian Wall Street Journal)

The falling won has resulted in 30 to 80 percent increases in imported food prices. Sales of some luxury items are off by as much as 30 %. However large supermarkets and discount store sales are up significantly - perhaps more people eating at home.

CHINA - It is the view of our fresh fruit export marketing staff that all of the superlatives used to describe the potential of gaining access to the consumer market in the PRC are not exaggerations.

(Briefly summarize our current situation seeking access)

The steadfast help and determination of our government from the President to USTR - USDA - FAS - APHIS and Governors like California's Pete Wilson and Arizona's Jane Hull.

We've seen some accommodation for US horticultural products (apples, cherries, grapes) in the past year by the Chinese government but typically from limited geographically defined areas instead of areas defined by SPS science as compliments the provisions of the SPS Agreement for WTO Members.

While we are yet to gain official approval for selling our fruit in the PRC, we still see our fruit entering via Hong Kong brokers...we see our labeled fruit all over China.

Generally, exports to China and Hong Kong are not expected to decline significantly unless the Asian economic downturn becomes a protracted recession. Nevertheless, retail fruit prices are down at least 15 to 20 % in key China markets like Guangzhou, presumably due to reduced marketability in other parts of Asia effected by economic woes.

While historically a problem in China and elsewhere in Asia, trademark and fruit box counterfeiting is becoming an increasing problem. With local wholesalers putting domestically-grown, lower quality and cheaper fruit into what appear to be imported fruit boxes. This helps them collect a higher price. We've had first hand experience in this with "Sumkits" and "Ruuster" brands.

Note L.A. Times article re. PRC apples being sold in Taiwan as Washington and California fruit, complete with bogus labels.

VIETNAM- is a very new and developing market for us... as noted the duty on our fresh fruit is officially 30 % but the reality of the trade is inevitably different depending upon the relationship between the importer and customs inspectors. The infrastructure in Hanoi and Ho Chi Min City while lacking by US standards seems to be adequate for inbound fruit. Its been a fledgling market that no doubt will, like its neighbor Cambodia suffer significant drop in investment due to the Asian economic problems. However, long term we see this as a viable market for our fruit.

SINGAPORE-

- has been a major marketing center for us over the past twenty years but that role will likely change as Southeast Asian markets historically served by brokers in Singapore become more sophisticated in trade matters;
- Indonesia and Malaysia are now able to directly import into their markets;
- Singapore will ultimately change from a wholesale to a retail economy.

JAPAN -

- Sunkist has marketed successfully in Japan for a long time – it is our second largest foreign market - in the range of 11 to 14 million cartons of fruit per year.
- Today, Japan is the model for what we would expect of a trading partner in regards to sanitary and phytosanitary issues. That is not to say we have no disagreements but those disagreements we do have are legitimate and science-based. For example, despite our extensive efforts to exclude exotic pests from coming into California, casual travelers and more recently commercial contraband fruit importers have brought into California fruit infested with pests like Mediterranean fruit-fly the prompts quarantines in detection areas.
- Japan recognizes USDA's exotic pest quarantine and eradication program and continues to accept fruit from pest free areas of production outside the designated quarantine zones.
- In our view this is the way a quarantine program should work and does work with Japan. While we've had periodic incidents of Medfly, our fruit continues to flow to Japan without ever transferring a pest into their market. This is a point we continually make with a number of our other Asian trading partners - Korea, China, Australia and New Zealand.
- Difficulties in the Japanese market do occur - Disinformation Campaign of the Japan Offspring Fund re. California lemons, South African grapefruit (2-4D) and TBZ on U.S. apples.
- Our biggest ongoing complaint with Japan is the unconscionably high duties confronting our fruit - upwards of 38% for our navel (Winter) oranges and 20% for our Valencia (Summer) oranges. Last year our California and Arizona shippers paid nearly \$38 million to the Japanese treasury in tariffs. Hopefully, our government will in the scheduled 1999 agricultural trade negotiations be able to bring down those tariffs.

In fact, in all of the markets throughout Asia, the demand for our products is without question but we are held back by government restrictions, including tariff rate quotas and unjustifiably high tariffs. Thailand 51%; Korea 50% and 89%; Taiwan 40%; China 40% plus a 17% VAT.

Conclusion:

Despite what we read in the press and what might be occurring in other sectors of the economies of Asia, we view those markets long term and with great optimism particularly if our government is able to get those high tariffs reduced or eliminated in the next WTO round. Thank you very much for your time.

NEW FRONTIERS FOR AGRICULTURAL EXPORTS
OPPORTUNITIES IN AFRICA

Bonnie E. Raquet
Vice President,
Washington Corporate Relations
Cargill, Incorporated

Good afternoon. It is a pleasure to be here to talk with you about the future possibilities for American agricultural exports to Africa. I think my talk will not be as optimistic as you might wish, because in Africa, opportunities are limited today. We are, really, talking about possibilities and about the future, a future that can and will happen if the right steps are taken today to assist development in Africa, which will benefit American agriculture in the future.

As the title of my presentation indicates, I am going to focus on Cargill's experiences in Africa. But, I think that many of my comments would hold true, to a greater or lesser extent, for other parts of the developing world where we want to encourage investment and develop markets.

Also, my comments today will come from a background that may not be similar to other speakers you are hearing at this conference. I am an international trade lawyer by training -- not an economist, not a trader -- and in my current position as Cargill's Vice President for Washington Corporate Relations, my work focuses on policy development. It is in that framework that I will share our perspective with you today. Most of the statistical information is based on USDA or Economic Intelligence Unit (EIU) reports, specifically EIU's 1st Quarter World Commodity Forecasts for Food and the USDA Food Security Assessment dated, November 1997.

Cargill, as I am sure all of you know, is a privately-held agribusiness company. It was founded over 130 years ago in Iowa. Today, Cargill is headquartered in Minneapolis, Minnesota, and is involved in marketing, processing and distributing agricultural, food, financial and industrial products, with some 79,000 employees in over 1,000 locations in 72 countries, and with

business in approximately 100 more countries. Over the years, Cargill has had a lot of experience in the developing world, and more recently, in Africa.

Cargill has been active within Africa since 1981. Our current businesses in Africa include processing and trading cotton, coffee, cocoa, oilseeds and rice; development and marketing of hybrid maize, sunflower, sorghum and soybeans; trading sugar, malt, rubber, fertilizer, steel and grain; and the rural development work of Cargill Technical Services. We now have offices and facilities in 11 African countries, with annual sales of \$ 250 million from our asset-based businesses trading within Africa, and total trade (inside and through exports and imports) of \$ 1.5 billion. In these 11 countries, Cargill has a full-time work force of about 1,250, and we employ another 1,500 seasonal workers.

The need for food and agricultural imports exists for nearly every African country. What is missing is the ability to meet that need. Overall, too many of the countries of Africa rely too heavily on aid and do not have the infrastructure, the governance systems or the flow of funds to adequately feed their people

Let's look first at food security, broadly. In this effort, it is more helpful to think of the continent as three distinct and separate regions.

North Africa

North Africa has the resources to meet the nutritional needs of its people at current levels. If it weren't for frequent droughts and other social and governmental disruptions, the region could likely do so. The region currently relies on imports for 50 percent of its grain consumption needs. Egypt, for example, imports 40 percent of its overall grain requirements, but 55 percent of its wheat requirements. In North Africa, the need for imports of wheat are expected to remain high -- at or near the 97/98 peak of 16,000 tons through the year 2000. Although domestic planting areas have increased in recent years, they have likely reached maximum levels. Without significant changes in technology, given the problems with drought, and given that currency flows are largely dependent on oil exports (or in some countries, tourism or Suez Canal revenues), the ability to import all of what will be needed to make up for production shortfalls is subject to question.

South Africa

South Africa, while a likely net importer of all food in the future, is closer to having the economic stability and ability to feed its citizens. In fact, with the lessened impact of El Nino in 1997, they will have an exportable surplus that may assist their neighbors this year. Partly, this is the result of market liberalization, and I will speak in more detail of that later. Whether El Nino will be so kind with the next crop remains to be seen. Since grain production in Southern Africa, overall, has not kept pace with population growth, the per capita production numbers are trending downward. With the high year-to-year variability in growing conditions, the supply is not reliable. Famine can be an annual problem.

Sub-Saharan Africa

Sub-Saharan Africa, where population growth will outpace other vulnerable regions of the world by more than 15 percent, and where 24 percent of the world's poorest 1 billion people live, is facing the most difficulty. Although it is comprised of 37 countries, some of which have additional untapped potential, overall the region needs 8.9 million tons of food in addition to today's levels to meet expected nutritional needs. Aggregated base consumption levels in these countries are far below minimum nutritional requirements, and the gap is growing.

The region is fragile, and the already difficult situation -- in any particular region or country -- can be quickly exacerbated by weather, or by civil strife, and further exacerbated by inappropriate governmental policies.

When an El Nino drought materializes in Sub-Saharan Africa, there will be a maize shortfall and a much higher import need for grains. In fact if the maize shortfall is severe enough, -- according to the EIU forecast, if the South African crop falls below 1997 levels -- not only will South Africa not be able to supply white maize to its neighbors, it may have to import food (most likely wheat) as well. In both of these areas, rice demand will remain strong - but only as long as cheap product is available.

So - the demand exists. But, as you can tell from these rather bleak comments, that is not necessarily good news because of the significant problems in meeting that demand.

Cargill's experience in Africa has convinced us that the foundation stone for sustainable development in every African economy is agriculture. Unlocking Africa's latent agricultural productivity is the best way to begin self-sustaining, broad-based development. Food aid cannot and will not solve the demand problems I described. To succeed in developing a base on which to build functioning economies in Africa requires a very broad based partnership.

Let me explain, based on our experience:

As I described, people living in poverty have little margin for error in feeding themselves. Crop fluctuations or other natural disasters create risks of severe hunger. At some levels, those risks usually can be overcome through relief efforts and through trade. However, the solutions move out of reach when the shortages are compounded and relief efforts are imperiled by civil strife. Consequently, maintaining civil order and building political legitimacy must be first-line, critical responsibilities of the African governments and the institutions that seek to help them. Order and legitimacy are necessary preconditions for effective assistance.

Beyond the point of crisis, NGO's, working with USAID, the World Bank and other development agencies, can help. Cargill Technical Services, Cargill's own rural development subsidiary, like other development organizations, often partners with institutions such as USAID to provide technical assistance in helping farmers to improve what they grow and how they run their farms. This assistance ranges from help and advice on research into better seed varieties, to development of better storage facilities, to the deployment of basic processing units, such as village-sized hand-operated oilseed presses that allow farmers to produce edible oil for their own needs.

U.S. and international research institutions provide help over longer time lines by adapting technologies to local needs, supporting indigenous research and extension services and building up local agricultural support institutions.

While the improvements realized through these efforts are necessary, they are not sufficient for self-sustaining growth. They are not enough to break out of a subsistence economy to a dynamic growing economy.

To make this breakthrough requires real collaboration among local governments, governments, such as the United States, giving

development aid, multilateral development banks, and private sector agribusiness. In short, it requires investment and it requires a stable and predictable environment. Without such breakthroughs, the food-deficit African countries will not be able to produce food for their people, or products for export to improve the national accounts, nor will they be able to meet their needs through imports.

To achieve stable political and economic environments, the role of the national governments becomes critical. Efforts that are undertaken in Africa need to be better supported through the targeted application of aid contributions. Governments locally must reform their laws, build the infrastructure and promote the stability needed for development, reform and growth. The steps outlined in the administration's African initiative, and in the African Growth and Opportunity Act that is making its way through Congress, provide a framework for beginning this process.

We would also suggest that allocations of foreign development assistance receive even more focus, and that they be made on a priority basis to the governments most committed to reform -- governments that have undertaken, and are actually following, economic policies to promote market-based economic systems and have demonstrated the political will to carry them through. Policies to achieve those goals would include:

- ♦ responsible, fair and transparent trade, fiscal and monetary policies;
- ♦ properly valued exchange rates;
- ♦ a legal system based on the rule of law, not the rule of individuals, including laws that are enforced against bribery and corruption;
- ♦ secure rights of property ownership;
- ♦ a reliable and enforceable law of contracts and a fair, transparent dispute resolution system;
- ♦ credit policies focused on the farm sector; and,
- ♦ a movement toward democracy, the development of a civil society and greater individual freedoms.

Where these conditions (or, at least most of them) exist, private enterprise, and especially agribusiness, can help take the development process to the next level.

(An interesting statistic comes from a special study done by Mathew Shane, Terry Roe and their associates for the USDA. They state in their report that trade liberalization and supportive investments in agriculture in sub-Saharan Africa could add 1.0 percent to the base growth rate of real income per capita. This improvement would not solve the significant food problems I have described, but might prevent a further downward slide. Even more interesting, however, was their conclusion about what made a transforming difference in other developing economies they studied: (1) the formation of specialized financial institutions to support agriculture, (2) the organization of commodity and futures markets and (3) government organizations to provide marketing information. In effect, transparency, credit and information.)

For-profit agribusiness companies can help this process. They become the pathway through which such needs can be met -- both within Africa and in the parts of the world that are markets for African products. Agribusiness uses the global market to match the needs of the rest of the world with the capabilities of Africa. When the countries of Africa are serving needs beyond their borders, business helps generate wealth. Then, and only then, will the people begin to have access to the food and agricultural products that are the basis for adequate diets, for productive living and greater food security. Then, and only then, can economies be built that become markets for imported goods that add to the quality of life and become exporters of products to other parts of the world.

Some cases in point:

South Africa

The new post-apartheid government has taken steps to adopt the policies described above. We have seen changes in the marketing of maize, one of the country's most important agricultural products.

Previously, the government-owned and -run maize marketing boards were intended to "assure food security." In fact, what they did was prevent the development of a functioning market system. Prices were fixed by the boards, without reference to the demands of the market, so farmers planted what the boards would pay for,

and not what the market wanted. For example, in many years the board supported the production of yellow maize, despite a strong demand for white maize.

The new government did not want to support the old system that was seen, more than anything, as protection for the white commercial farmers. It wanted to build a system that would be responsive to the market, make food more cheaply available to all their consumers and take advantage of the unique strengths of South African agriculture. The Ministry of Agriculture worked with the partnership I have described above. The ministry brought together agribusiness companies with agronomic experts and South African farmers and built a new, stronger and more transparent system.

They began by removing price controls from the domestic market, though they did not immediately disband the boards. This slow and cautious approach allowed all parts of the economy to adjust to the change, and protected the farmers' planting decisions for the short term. As a first step, internal prices were allowed to be established by the rules of supply and demand, rather than by artificial restrictions of a government-run board. Slowly, they opened the export market, and for a period, the commodity traders competed in the export markets side-by-side with the state-run boards. Gradually, traders were allowed to take price risk, then price supports were removed, and exports were allowed to freely respond to and compete in the international market.

A small futures exchange was created for white and yellow maize, so that prices in those commodities were more transparent to the market. The government set up a grain information service, so that farmers could learn how to make informed planting choices and compete in the free market, rather than being dictated to by the boards. Exports and imports both moved freely into and out of the country.

White maize prices rose 150 percent, driven by predictions of the impact of El Nino, stimulating farmers to continue planting white maize, and leaving the yellow maize to be imported. South African farmers are able to capitalize on the market demand for white maize and find it more cost effective and better for the economy to import yellow maize when there is a shortage.

In South Africa, Cargill has assisted and participated in this change. In addition to participating in the shift to the more open and transparent demand driven marketing system, we have two seed research and development programs in place -- one in South

Africa and one in Zimbabwe. These programs incorporate Cargill's worldwide technology in breeding methods and germ plasm to improve yields, disease resistance and stress tolerance. On the production side of the seed business, we have provided 200 person years of employment. We are taking hybrid seed technology to emerging farmers and teaching them new and better agronomic practices.

Tanzania and Zimbabwe

Cotton is produced in the Lalago area in Tanzania. When Cargill first arrived there, the cotton industry was controlled by parastatals and cooperative unions that left it wracked with corruption and unable to understand marketing principles. Farmers were being paid for their cotton by the government-owned cotton board in promissory notes which entitled them to payment sometime in the future. Often, the wait for payment was three months or longer; sometimes farmers were left holding empty promises.

Under pressure from the donor community and the IMF, the cotton sector was opened to private businesses. Cargill set up cotton buying stations, started paying farmers with cash and established cotton ginneries that provided much-needed jobs and family income. That infusion of capital into Lalago made a significant difference. A local economy was born. Mud huts gave way to new brick homes. A school and clinic are operating. Electric power arrived five years sooner than expected. Small businesses have sprung up.

A similar situation existed in Zimbabwe, and Cargill investment in cotton ginning in that country has resulted in a similar success story. In Zimbabwe, another breakthrough has been the employment of women in the ginneries, providing them and their families with a financial independence they did not previously have. Earlier last year, much to our surprise, those women travelled 80 miles to our office in Harare to put on a demonstration thanking Cargill for its investment and for putting cash into their local economies.

Last year, Cargill in Africa (this includes work we are doing in cotton in Malawi as well) processed 100,000 tons of cotton. This produced more than 200,000 bales of lint with a value in excess of \$60 million that we exported to the world market through the efforts of our international cotton trading subsidiary. The 65,000 tons of cotton seed separated from the cotton lint formed the basis for value-added products for other businesses. The

seed was sold to a locally owned oilseed crushing business right in Tanzania. The crushing business sells the oil locally, and the byproduct, cotton seed cake, is exported to South Africa.

Our investments in Tanzania and Zimbabwe increased output of a crop already established there; added value to that production through our ginning, trading and processing businesses, creating jobs and income; and we transferred knowledge local farmers could use for more sound husbandry of the local natural resource base.

In Tanzania, however, we have reached a possible limit on further investment. The roads are woefully inadequate for transporting more cotton than we currently do. Energy to run additional gins is not readily available. The partnership I described earlier needs to come together to improve the overall business environment. The good news is that in that part of Tanzania, what is needed is assistance, not aid.

Malawi

In the early 1990's the U.S. government worked with the Malawi government to encourage the sale of the government-owned oil processing businesses. Cargill purchased a share in the country's oilseed crushing and refining and rice milling business, NOIL. Under its former state ownership, the business experienced regular annual losses in excess of \$1 million. This loss was paid for by the Malawi taxpayers. Through the incorporation of technology developed in our other operations, we revamped the crushing process, upgraded the refining and milling processes and expanded the local market for oil and rice. In fact, Malawi has begun exporting rice to some of its neighbors, laying the foundation for a regional trading system. The business is now making a profit and paying corporation taxes to the government -- a net turnaround for the Malawi treasury of \$1 - 1.5 million. And, with Cargill's practice of reinvesting most of its earnings inside the country, Malawi is benefiting from increased local cash flow and spending power, as well as from the investment.

All of these stories demonstrate clearly what can happen when individual local governments have encouragement from a broad partnership of aid, from the assistance community and from for-profit agribusiness investors to do the right things: to create the right environment for investment, to defeat

corruption, and to follow economic policies that allow businesses to grow and markets to work.

What, then, is the payback to United States' agriculture? How does this all translate into "opportunity" for the American agricultural community? The answer is really quite simple, and we have seen it demonstrated time after time as other parts of the world have developed. As economies in Africa are strengthened by economic and legal reforms, and as local and regional prosperity grows, people will have more broadly shared buying power. Like all developing parts of the world, African people breaking out of poverty will first seek improvements in their diets and in the way they live, creating a market for imported grains and food. Then, we see the creation of stronger markets for clothing, consumer and capital goods, technology, and further investment. If we all contribute to the effort, and support political and economic reform, Africa will become a larger market for those goods reflecting the United States' comparative advantages.

This upward spiral requires each partner in the development process to play its role well. The African governments, the foreign governments (like the United States), the aid community, the multilateral development banks, universities and research organizations and private enterprise -- each must contribute its special part. For those of us who have tracked African development for decades, we know we must be patient, supportive and insistent on getting the fundamentals right. We also know that once these economies break free from years of central control, corruption and other economic mis-steps, we will see a freer entrepreneurial spirit. The world economy and the U.S. farmer can only benefit from the long-awaited addition of the African contributor and consumer to the global market place. This will benefit not only the people of Africa but also the American farmer.

**Central And Eastern Europe
Agricultural Trade Outlook**

Jeffrey R. Beard
Director of Central European Operations
Pioneer Hi-Bred International Inc.

Good afternoon. It's a pleasure to join you today at this year's annual forum, and to speak to you about the trading and agricultural outlook in Central & Eastern Europe. I live in Vienna Austria, and my Central European responsibilities for Pioneer over the past five years has allowed me to see first hand the transition these emerging markets are undergoing. It's both a very difficult but exciting market: one filled with both peril and hope.

I have prepared some overheads showing grain areas, production levels, livestock, and net-export levels for all of the Central European countries. These countries are defined as Poland, the Czech Republic, Slovakia, Hungary, the former Yugoslav States, Romania, and Bulgaria. I'll also briefly address the Ukraine.

Many of the people here today are interested in the trading opportunities in the CEEC's for grain and livestock products. However, one cannot look at the data without having a sense of the historical context which these numbers and trends represent. Everyone knows the dramatic political changes which occurred in 1989 have affected these countries significantly. So let me first step back and provide some historical context, talk about the current reform program, and then we'll look at the data and trends. Finally, I'll conclude with some observations and thoughts regarding how these collective countries might improve their agricultural capabilities to western levels.

BACKGROUND

Combined, the ten Central European countries have a population of about 106 mil and a land area of 1.1 mil square km. This is about 29% of EU-15 population and 33% of EU-15 area. In terms of area, contribution to GDP and, in particular, share in total employment, agriculture is relatively more important in the CECs than in the EU. On average over 25% of the work force is employed in agriculture (e.g. a total number 9.5 mil, compared to 6% or 8.2 mil in the EU). Agriculture still contributes 8% to GDP (compared to 2.5% in the EU).

It is well known that the initial impact of the changes which resulted from the collapse in 1989 was a severe recession throughout the Central and Eastern European region. Sharply higher consumer prices, coupled with falling real income, led to a dramatic decline in overall food consumption. This led to lower prices for agricultural producers who, at the same time, faced sharply higher input prices and caused livestock inventories to plunge. The crop sector's response was slower, with 1990 and 1991 characterized by surplus production and high net exports. It was only in 1992 that crop production began to drop, due principally to yield

decreases resulting from lower input use and poor weather. Area - particularly grain area - has changed little. Since 1995, the agricultural sector has begun to recover, building new, often informal, networks to supply farm services and inputs, and to distribute food to city markets. Farm credit systems have developed, prices have now stabilized, and trade arrangements are being re-established.

By the end of 1997, all of the CECs have begun the process of recovery, in particular in the crop sector; however agricultural output remains below pre-transition levels (except Slovenia and Romania). Output was affected by the fall in demand as consumer subsidies were removed and the general economic situation deteriorated; also by the price/cost squeeze that agriculture faced (*e.g.* input prices rising much faster than output prices).

The degree of privatization and de-monopolization achieved in the up- and downstream sector differs between countries. Delays in the privatization and in the breaking-up of the large state monopolies in these up- and downstream sectors was one of the reasons for the price-cost squeeze the farm sector experienced in the first years of transition. When considering the relatively low level of farm-gate prices in the CECs, these downstream inefficiencies contributed (in the case of wheat, for example) to an almost doubling of the farm-gate price in order to get the product to the border. A return to profitability of farming will, to a large extent, depend on a competitive downstream sector and on a reorganization of the farm sector itself (*e.g.*, in bundling supply and strengthening its negotiating position vis-a-vis the food-processing industry and distribution channels).

AGRICULTURAL REFORM IN THE TRANSITION ECONOMIES OF CENTRAL AND EASTERN EUROPE

Extending the present CAP to the CECs will be too costly for the EU budget. The major obstacle is, however, not just the high cost. High food prices would make food expensive to the poor. Moreover, the use of supply management policies, which are a cornerstone of CAP, is highly inappropriate for CECs. The cost to the EU budget would be considerably lower if direct payments were not extended to farmers in CECs, the argument being that they should not have compensatory payments for incomes they never enjoyed. Regardless, EU support prices are expected to be reduced anyway as a result of the ongoing "Agenda 2000" and CAP reform discussions.

For the CECs, there are limitations to the extent prices can be allowed to rise. As long as food expenditures still consume 30% to 60% of household income and as long as inflation rates remain in the range of 10% to 30% a rapid increase in agricultural and food prices would be economically damaging and socially dangerous. The price gap between the CECs and the EU can therefore be expected to continue to exist for the foreseeable future, even if it will decrease more or less noticeably, depending on the product. Over time the price gap can be expected to be eroded to a certain extent by a relatively high inflation (not fully compensated by currency depreciation) and by a rise in domestic agricultural prices as food demand will recover more quickly than supply. In a situation of rising output, production costs will be more fully reflected.

I've already mentioned the up- and downstream inefficiencies that exist in the CEC's . According to a recent study published by the European Commission, farm gate prices for soft wheat in Poland and the Czech Republic were, in 1995, 80% and 60% (respectively) of EU prices, whereas producer prices for chicken stood at 100% in both countries. It stood at 80% for pork in Poland but at 100% in the Czech Republic and Hungary. Internal producer prices for cereals reached around 65% of Union prices for the period 1994-1996, whereas pig and poultry prices stood at EU price levels. Consumer prices have also been lower than in the EU. Retail prices for bread in Poland and in the Czech Republic were at 30% of EU level in 1995, whereas retail prices for chicken was at 70% in Poland and 50% in the Czech Republic. According to a study done in 1996 by the French agricultural research institute INRA, Hungary retail prices for bread in 1995 were 23% of the French level; for chicken it was 62% and 42% for pig meat. Given the expected economic growth in the applicant countries, it is estimated that their price levels will come closer to the European Union level before they become members. Currency movements will have an effect on this as if the accession countries' currencies appreciate in value (in relation to the Euro), the gap will narrow. The opposite occurs if their currencies devalue.

In all the applicant countries, agriculture is being supported and protected in various ways. With the exception of Estonia, in all other countries the market price of at least one cereals crop, normally wheat, is supported by market agencies which apply a minimum purchase price. In the oilseeds sector, only Lithuania provides market price support for rape-seed. Cereals' tariffs are relatively high and close to Union levels with the exception of the Czech and Slovak Republics.

When we look at the livestock sector, the picture of support is more varied. With the exception of Bulgaria and Estonia, milk prices are supported in all ten countries concerned. Market price support for meat production is found in Lithuania, Romania, Slovakia, and Hungary. For the region as a whole, pork and poultry consumption and production have recovered from the slump of the first half of the nineties, but consumption has not yet reached the level it had before communism fell. It is expected to increase as income levels improve. However, higher consumer prices as a consequence of membership in the Union may have an effect. The European Commission in a working paper on "Long term Prospects of Grains, Milk and Meat Markets" published in April, expressed the view that *consumption* of pig-meat will remain stable after accession while the growth in poultry consumption may slow. The Commission, on the other hand, forecasts that *production* of pork and poultry products will continue to rise, leading to a growing surplus in an enlarged Union.

Current members of CEFTA include the Czech Republic, Hungary, Poland, Slovakia and Slovenia. The general pattern emerging in these countries is a process of rationalization of their agriculture towards a market economy but with decreased levels of output, especially in the livestock sector. In terms of trade in food and agriculture, Hungary has maintained its position as a net exporter, but may be a net importer of corn and barley by 2000 unless yield levels improve. Net imports have risen in the Czech Republic, Poland and Slovenia while the net imports of Slovakia have remained stable. All CEFTA members have increased their agricultural and food imports from the EU but have made less progress in terms of exports to the EU.

EU-associated non-CEFTA countries include Bulgaria, Estonia, Latvia, Lithuania and Romania (although Romania, as of July 1st, has now joined the trade pact). These countries have also witnessed sharp declines in agricultural production during the transition period. As in the first group, the decline has been more severe in the livestock sector than in the crop sector. With respect to trade, the Baltic states have significantly increased their imports of food and agricultural products, Romania has remained an overall net importer but with variations from year to year and Bulgaria has retained its trade surplus despite the sustained shortfall in production.

EXAMINATION OF CEE GRAIN & FEED TRENDS

The ERS baseline for Central and Eastern Europe projects the region to become a growing net exporter of wheat, maize, and beef; a declining net exporter of pork and poultry; and a growing importer of soybean meal and soybeans over the projection period of 1997 to 2006. The region includes Poland, the Czech and Slovak Republics, Hungary, Romania, Bulgaria, Albania, and the former Yugoslavian states. The major shortcoming of their projection is that it assumes that none of the applicant countries will join the EU during this period....an assumption I do not share.

With this backdrop, let's now take a look at some of the data to see what's happening with grain, oilseeds and meat trends, focusing mainly on the net export trends so you can see where the opportunities for U.S. producers may lie. The Central Europe region is known primarily for being a wheat producer (*slide 1*). Poland is the most dominant, while Poland, Romania, and Hungary collectively make up about 60% of all CEC production. (*slide 2*) For corn the picture changes with the former Yugoslav states making up about a third, Romania a third, and Hungary providing about a fourth of all production. (*slide 3*) For barley, the dominance is spread out a bit more evenly across the northern countries with Poland contributing a third, then probably the Czech Republic a fourth, and with Slovakia, Romania, and Hungary making up the lion's share. (*slide 4*) When we look at grain production, wheat is almost double the output of corn for the primary C.E.E.C. countries, with barley trailing by a third. (*slide 5*) For oilseeds, sunflower is clearly the winner, and as you can see, soybeans are almost non-existent. (*slide 6*) Meat production-wise, this graph shows the slump caused as a result of the 1989 political changes, but also shows that the key meat product in these countries is pork, then increasingly poultry, followed by beef (whose levels have been trending downwards due to price).

One of the reasons for the continuation of this slump for beef is the low prices for both dairy and beef reflect the de-capitalization of herds (the costs to maintain production potential in quantity and quality terms are not being met). Also, for beef, the lower quality of production is based on *dairy herds* as most CECs have no specialized beef herds. So, for the livestock sector the recovery will be less dramatic. For dairy, we expect the net export potential to be significantly lower than in the pre-transition period, for while the *supply and demand* for meat will remain (more or less) in balance, it will be at a lower level as compared to the pre-transition period.

Moving to the individual countries, **Poland** is one of the largest agricultural producers, but is a consistent net importer for grains (*slide 7*), oilseeds (*slide 8*), and meat (*slide 9*). Although crop yields have been improving, productivity has not been able to keep up with increased consumption, forcing the country to be a net importer for much of their agricultural needs. In **Hungary**, we see a continued rise in wheat exports (*slide 10*), but corn may be in danger of

becoming a net import crop as we see livestock numbers increase, and a shift toward using more corn in that feed-mix. In the oilseeds area (*slide 11*) we see increasing levels of sunflower oil exports, matching the hectareage increases, with rape-seed moving to a net export status after 1995, but soybeans remaining a net import. For meat (*slide 12*) the steady pork export trends probably correlate to the net corn comments I've already spoken to with beef and poultry remaining at fairly constant levels.

As we move down to the southern Balkans, Romania net meat exports (*slide 13*) show the increasing need to import beef and poultry, with pork exports trending downward. The disappearance of many of the export markets available during the communist era has reduced production levels for pork, coupled with some increasing domestic consumption as their recovery starts to take hold. For grain (*slide 14*) wheat exports will remain close to 800,000 MT, but corn exports will be reduced as local consumption for livestock will increase faster than yield gains in the field. For oilseeds (*slide 15*) we may see more sunflower exports as hectareage continues to rise. Soybeans will continue to be a net import crop for the foreseeable future. In Bulgaria, 1996 was a catastrophic year agriculturally as 1997 was politically and economically. (*Slide 16*) As you can see here, uncontrolled exports of grains in 1995 caused a bread crisis in 1996 resulting in a need for the government to import a high level of wheat. Good yields this past year resulted in a small level of net exports, which should continue to rise as yields return to pre-1989 levels. In oilseeds (*slide 17*) the drop in sunflower hectares combined with bad growing conditions have significantly reduced sunflower exports. Moving briefly to the Ukraine, the rising trends in grain exports (*slide 18*) is due more to decreased local consumption as a result of the recession. Hectareage planted remained more or less level (increasing for wheat, matching decreases in barley, with corn staying relatively flat). (*slide 19*) The Ukraine is a big sunflower producer and will consistently be a net exporter, while their net meat exports (*slide 20*) will be reduced for beef, and they will end up needing to import pork and poultry until their animal production capacity is restored. This next slide (*slide 21*) shows the decreasing production trends in this region for primarily beef and pork.

Moving briefly to the former Yugoslavian states (*slide 22*), dominated by Serbia, has seen and continues to see disruptions, not only from the events of 1989, but the fallout from the 1991 war. Corn is king with net exports reaching 1 Million MT this past year. In oilseeds (*slide 23*) they are net importers for soybeans, sunflowers, and rape-seed. Until the political problems for this region are fully resolved, it will be difficult to predict the agricultural trends for this region.

Finally, finishing off with the former Czechoslovakian state (*slide 24*) we see in the Czech Republic, for grain, they will remain net importers of barley and corn while wheat exports will soar. In oilseeds (*slide 25*) they'll continue to import soybeans and sunflower while rape-seed exports (which the country is more suited to grow) should level off around 40,000 MT. In Slovakia (*slide 26*), wheat will continue to be exported and barley imported, while in oilseeds (*slide 27*), sunflower exports will increase as hectareage planted to this cash crop continues to rise. Rapeseed imports will primarily come from their Czech neighbors.

I did not plan to cover the Former Soviet Union (FSU) countries, however (*slide 28*) this slide shows their problems are continuing with no foreseeable turnaround in sight. We start to see some slight upturns beginning in 1999.

So, when we look at the region as a whole, the data begins to reveal the negative impact of the recession that followed after the 1989 transition period, but it also shows the recovery that is now beginning to occur. Demand for local consumption is increasing more rapidly than the population growth. Rising prosperity in this region will mean a shift toward consumption of more animal products, and that, in turn, will require higher levels of cereal crops to be used as feed to produce the animals. This *multiplier effect* means that a greater amount of cereals will be needed to supply the same amount of calories at the dinner table.

SUMMARY & CONCLUSIONS

The CEC agricultural sector stands ready to enter the new millenium with significant potential for increased output and gains in productivity over the next ten years. However, this conclusion is based on the following assumptions:

- The general income growth in the CECs will lead to a certain recovery of demand for agricultural products - in particular for livestock products - although the pre-transition levels of per-capita consumption will likely not be reached. A rise in animal production will also increase the feed demand for cereals.
- Agricultural production can thus be expected to continue to grow in coming years, albeit at a slow rate. Undoubtedly, the CECs have a significant production potential. The big structural difficulties to realize this potential in the foreseeable future should, however, not be overlooked.
- In most countries, completion of land reform and restructuring of the food chain will take at least another ten years, while farm structures can be expected to evolve even more slowly as the capability of agriculture to attract investment will remain limited.
- The use of inputs is recovering and will contribute to an increase in productivity, but is not likely to attain pre-transition levels, when taking into account the development of input-output price relationships and the previous practice of wasting inputs unnecessarily.
- By 2000 supply and demand patterns in CEC agriculture are expected to have fully adjusted to the transition shock. In the crop sector there will be a certain shift towards cereals and oilseeds. Over the longer time horizon, as crop yields begin to approach western Europe levels, the CECs will increasingly become net exporters, surpassing their potential compared to the pre-transition era.

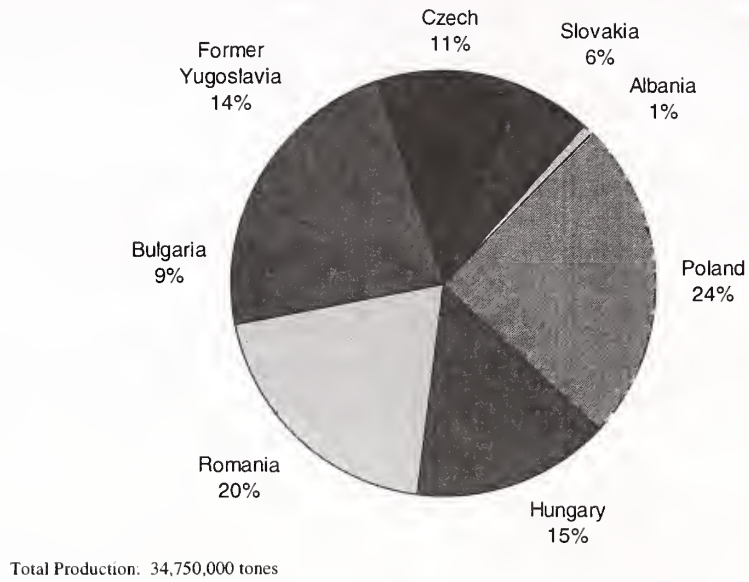
So, although the CEE markets represent good export potential for U.S. producers in the short term, this picture will begin to change as their recovery progresses. Near-term, as their rate of GDP increases and diets improve, consumption trend increases will outstrip internal capability and these markets will be attractive to US producers. Longer term, however, we will see significant improvement in capability and capacity of their grain, dairy, and livestock sectors to the extent that these countries will be net exporters, and compete with US producers for the world's growth markets.

Even though existing structural problems remain as obstacles, the picture is becoming increasingly brighter. While the transition period is taking longer than expected, trade pacts (like CEFTA) are helping to gradually integrate the CEC economies, trade restrictions are being

increasingly abolished, the volume of foreign direct investment is rising, and good progress is being made in the area of structural institutional reforms. The USDA painted the following optimistic scenario for the future in their recently published "Central & Eastern Europe: An Emerging Agricultural Exporter" (July 1997): "During the period to 2006, most of these obstacles will be overcome. As the CEC governments bring inflation under control, interest rates should fall, thus encouraging more investment. As land tenure becomes more permanent and capital markets improve, true land markets will develop. Eventually these developments should lead to more efficient farms."

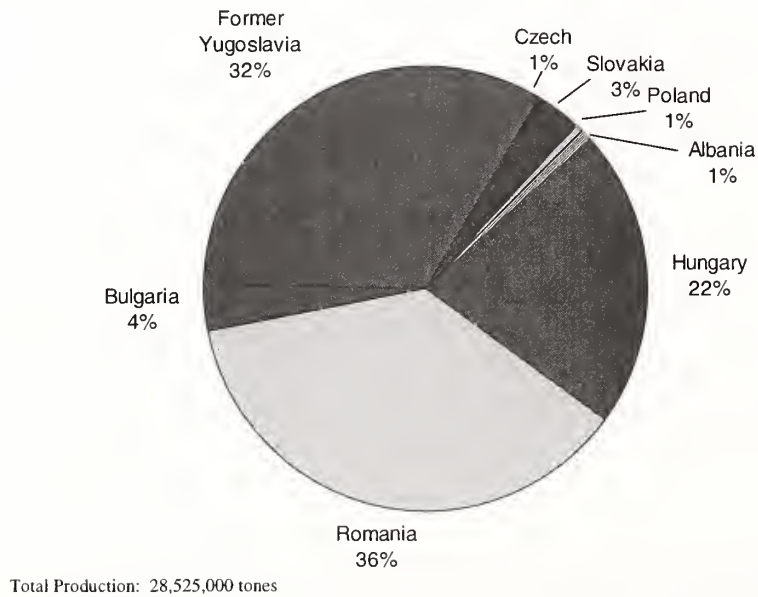
Thank You!

Central Europe Wheat Production - 1997



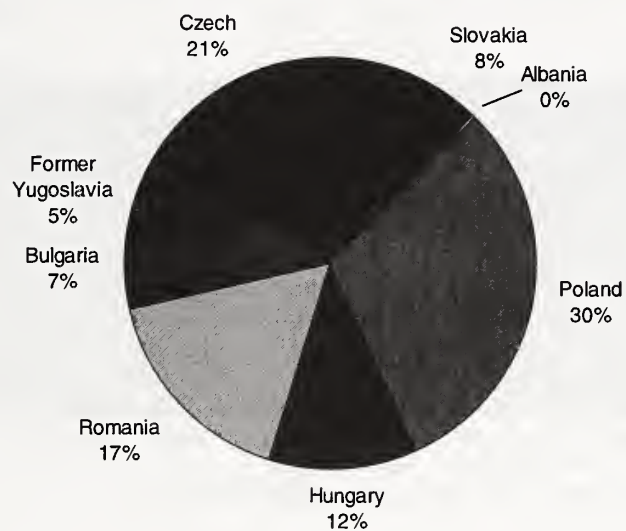
1

Central Europe Corn Production - 1997



2

Central Europe Barley Production - 1997

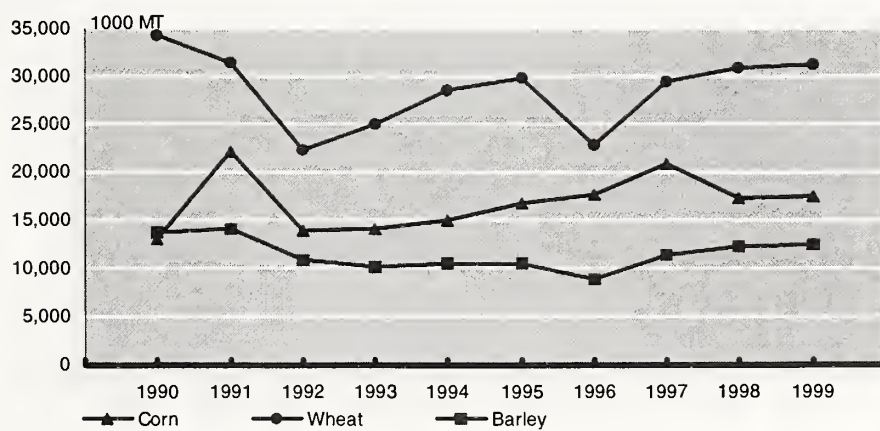


Total Production: 12,055,000 tones

3

Grain Production

Region 1*

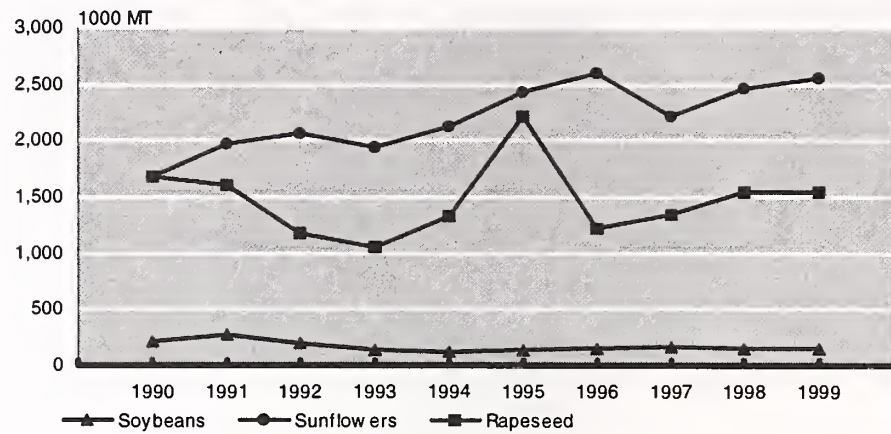


* Region 1 includes Bulgaria, Czech Republic, Slovakia, Hungary, Poland, & Romania.

4

Oilseed Production

Region 1*

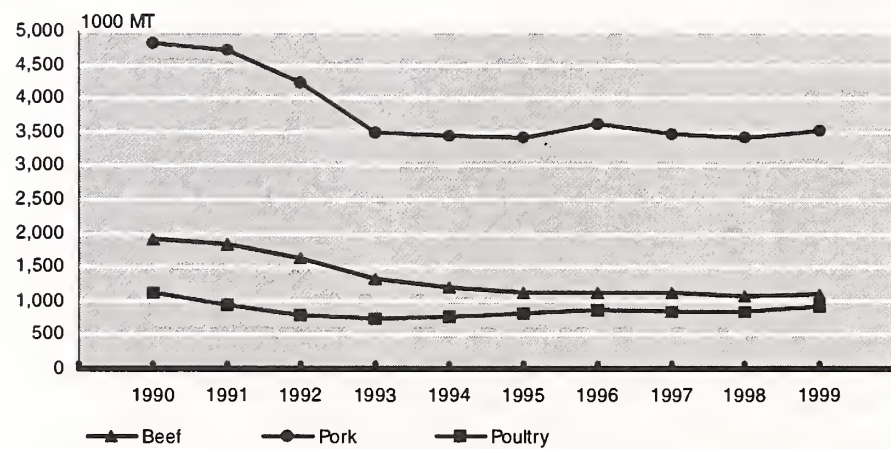


* Region 1 includes Bulgaria, Czech Republic, Slovakia, Hungary, Poland, & Romania.

5

Meat Production

Region 1*

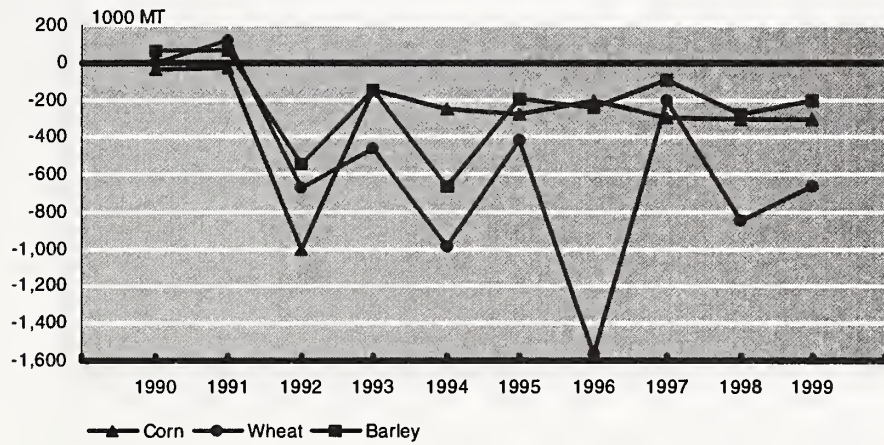


* Region 1 includes Bulgaria, Czech Republic, Slovakia, Hungary, Poland, & Romania.

6

Net Grain Exports

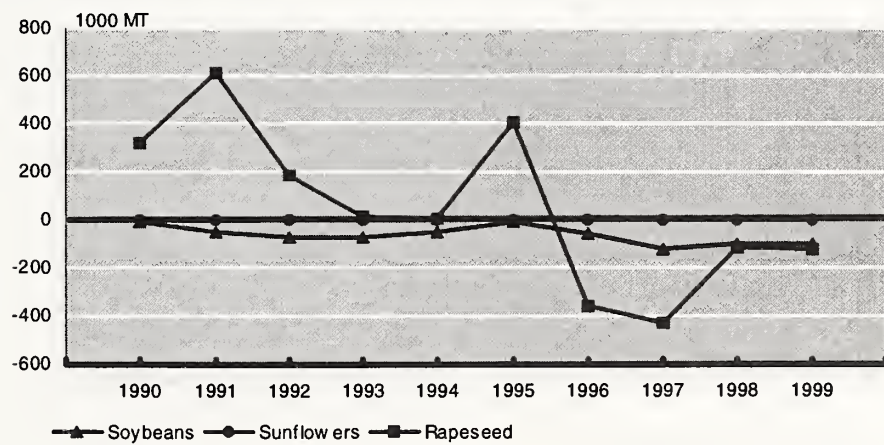
Poland



7

Net Oilseed Exports

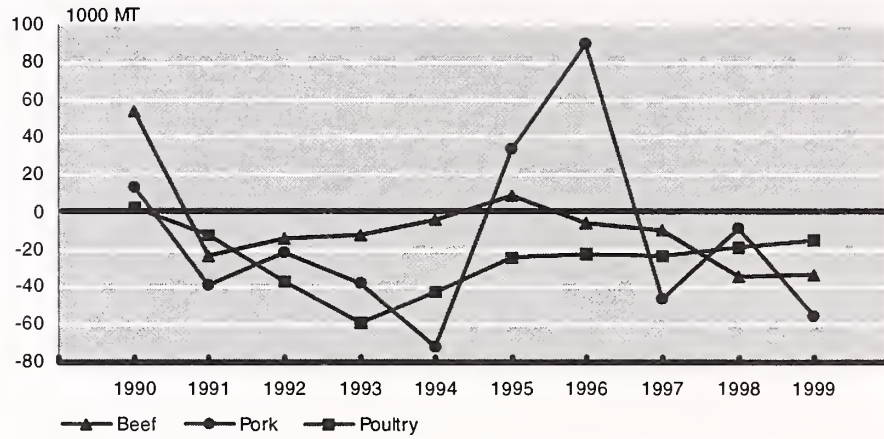
Poland



8

Net Meat Exports

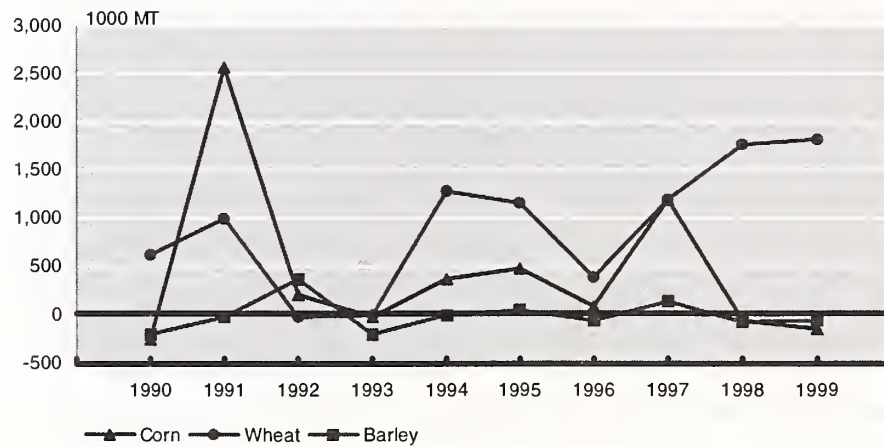
Poland



9

Net Grain Exports

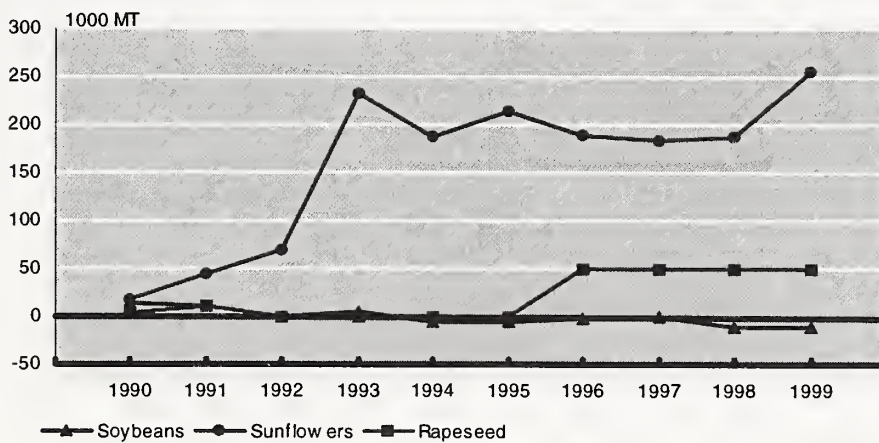
Hungary



10

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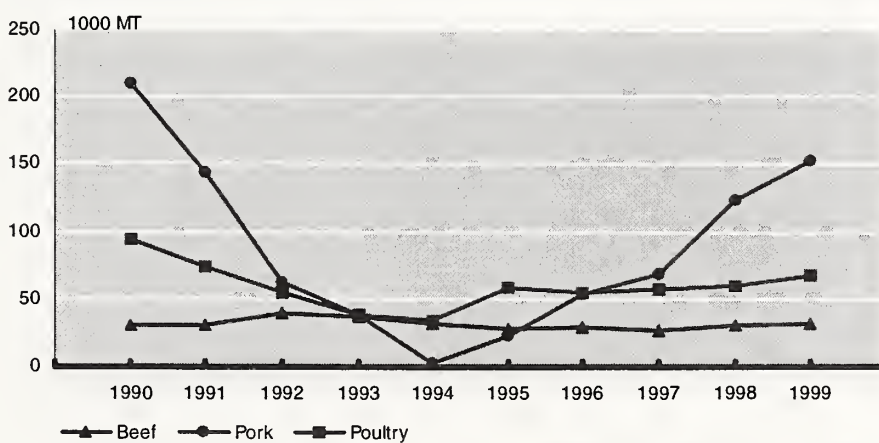
Hungary



11

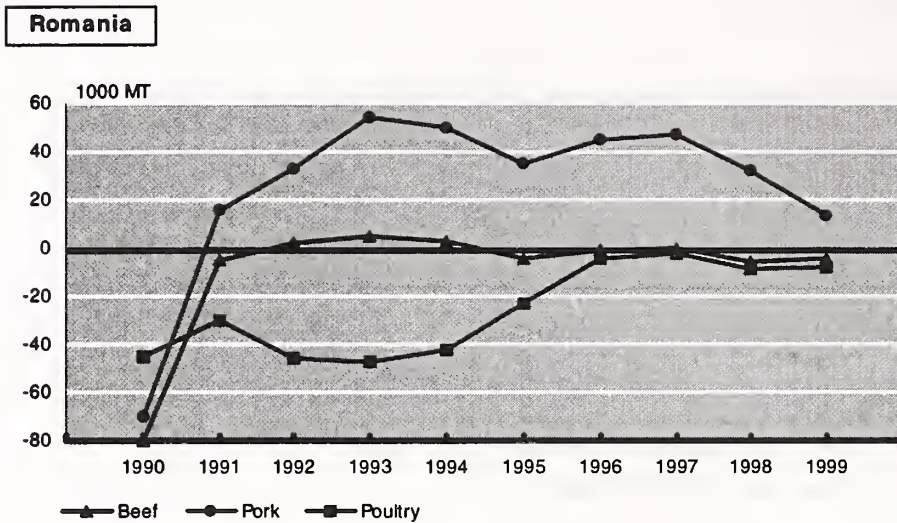
Net Meat Exports

Hungary



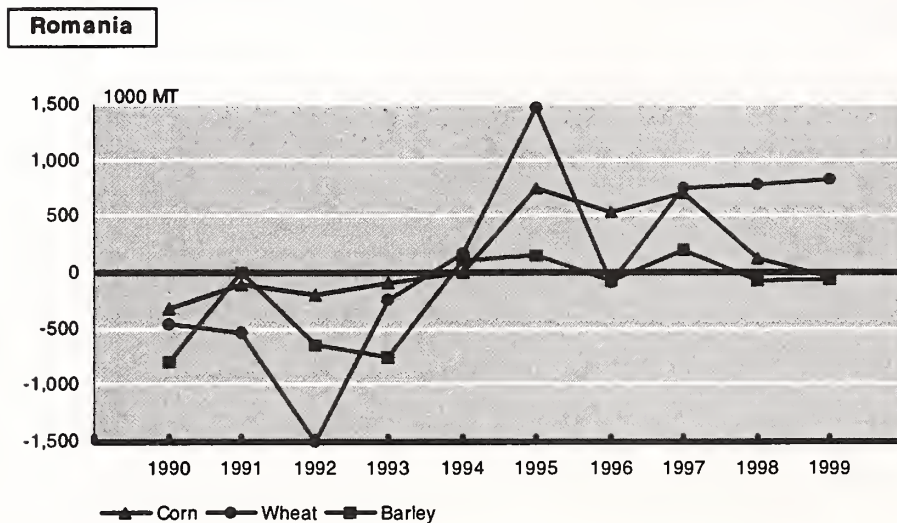
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Net Meat Exports



13

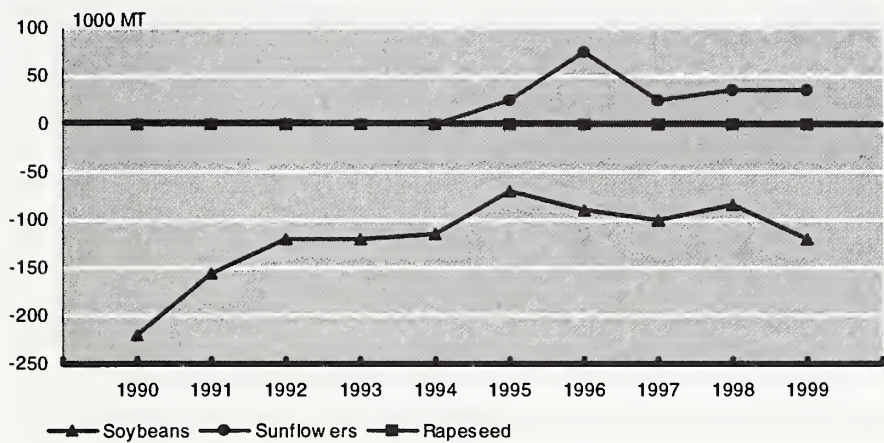
Net Grain Exports



14

Net Oilseed Exports

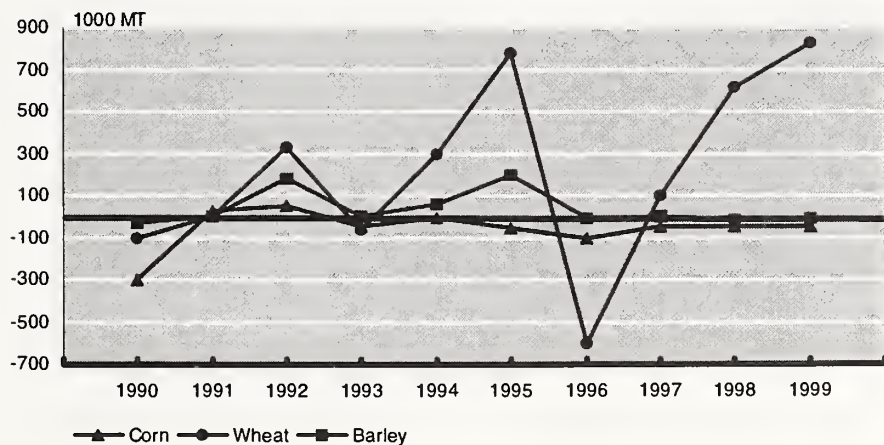
Romania



15

Net Grain Exports

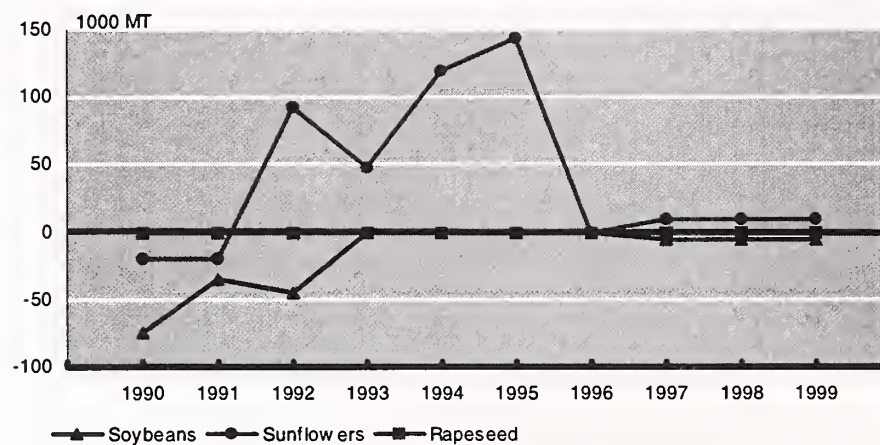
Bulgaria



16

Net Oilseed Exports

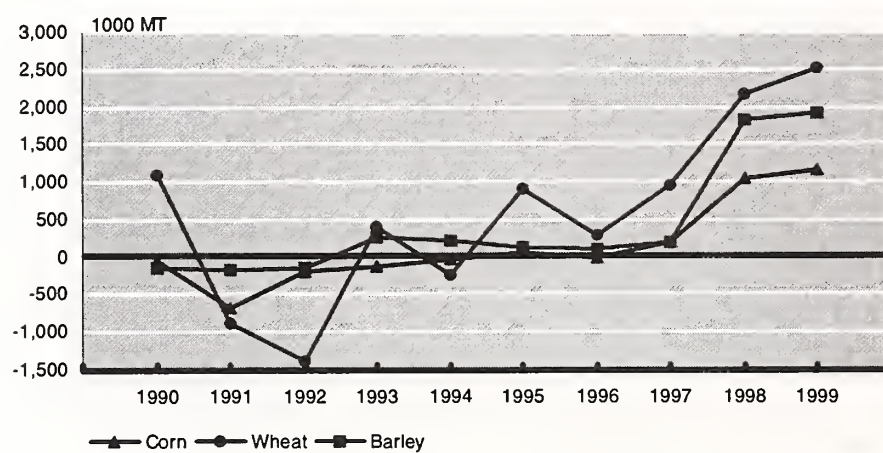
Bulgaria



17

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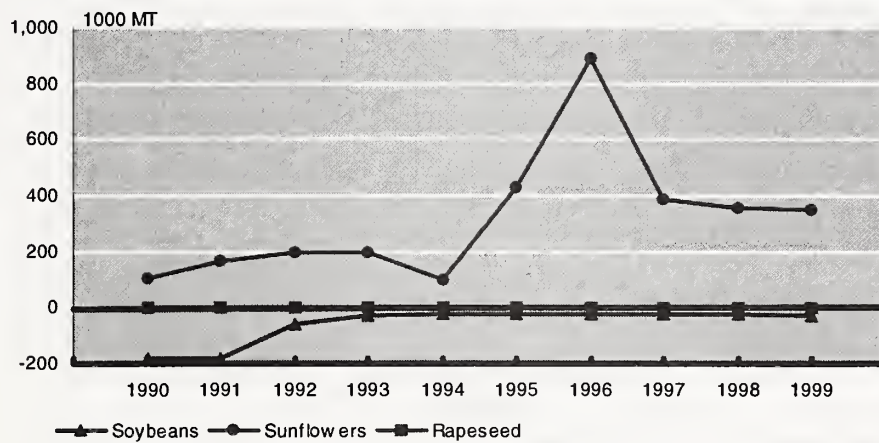
Ukraine



18

Net Oilseed Exports

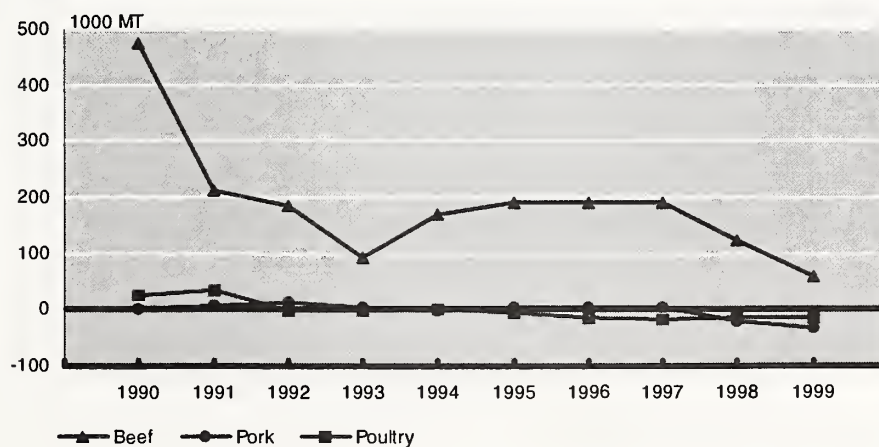
Ukraine



19

Net Meat Exports

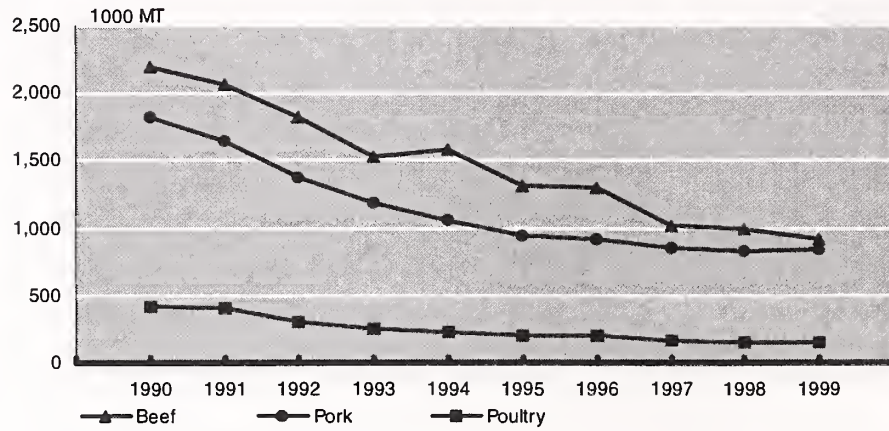
Ukraine



20

Meat Production

Region 3*

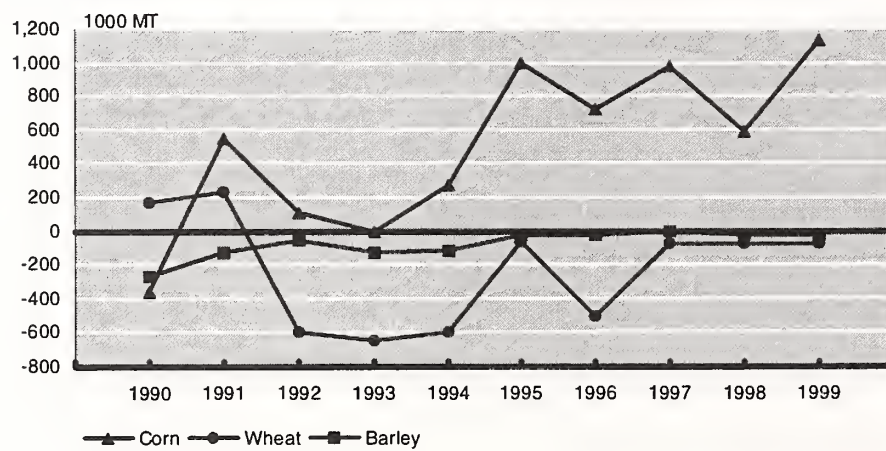


* Region 3 includes Estonia, Latvia, and the Ukraine.

21

Net Grain Exports

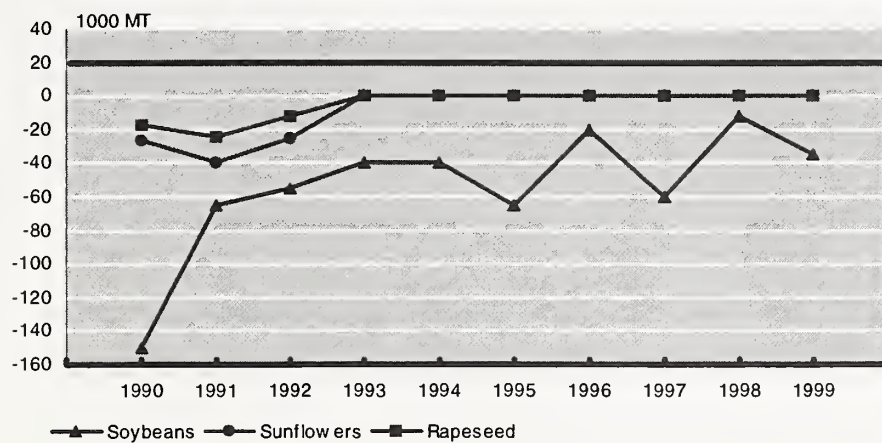
Yugoslavia



22

Net Oilseed Exports

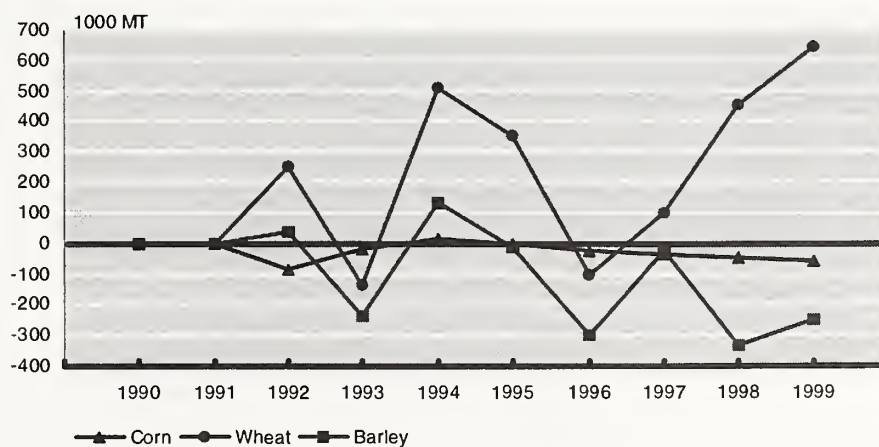
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23

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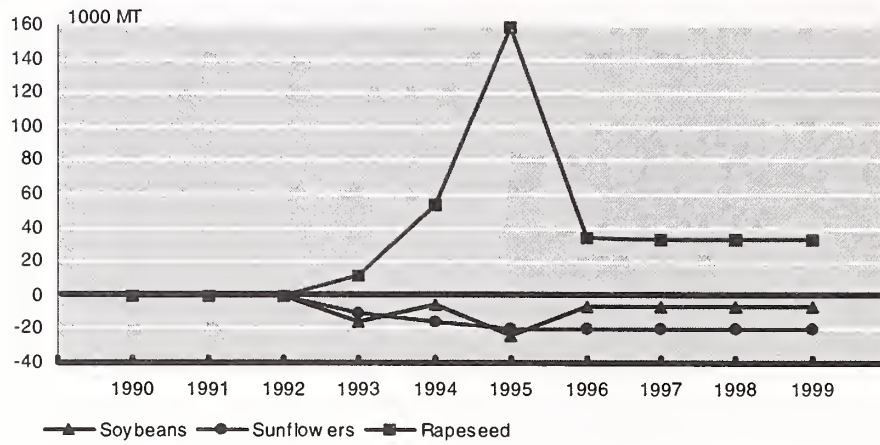
Czech Republic



24

Net Oilseed Exports

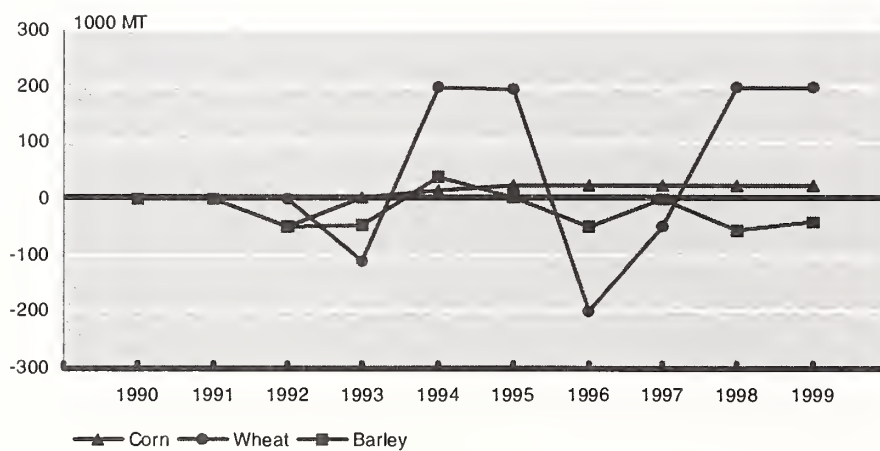
Czech Republic



25

Net Grain Exports

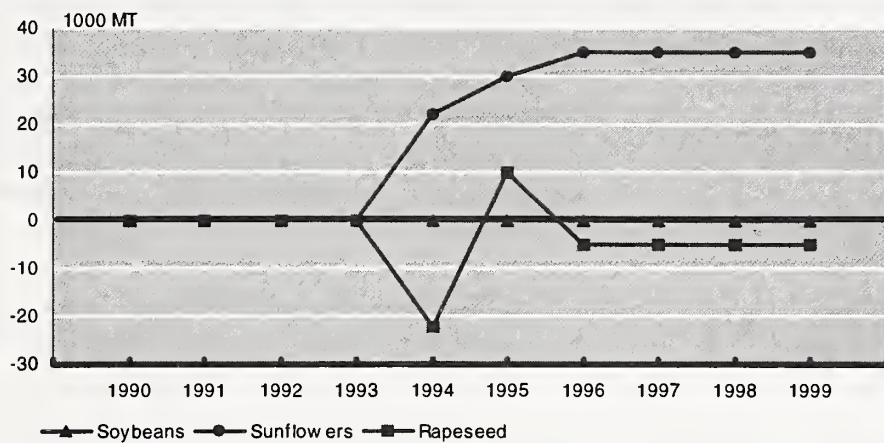
Slovakia



26

Net Oilseed Exports

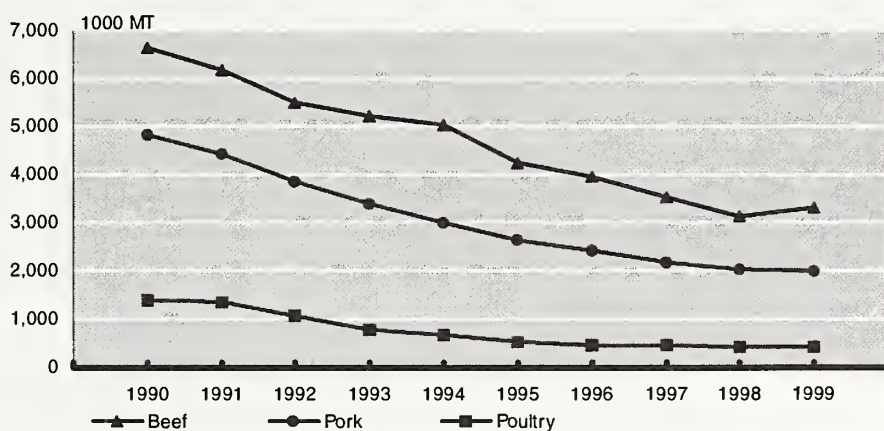
Slovakia



27

Meat Production

Region 4*



* Region 4 includes Albania, Russia, and the other FSU countries not included in Region 3.

28

HACCP and Meat and Poultry Inspection

John W. McCutcheon
Associate Deputy Administrator, Field Operations
Food Safety and Inspection Service, USDA

Good morning. My name is John McCutcheon, and I am the Associate Deputy Administrator of Field Operations, of the Food Safety and Inspection Service (FSIS), U.S. Department of Agriculture. FSIS is the federal Agency responsible for ensuring the safety, wholesomeness, and accurate labeling of meat, poultry, and egg products.

It's a pleasure for me to be here today. I've been asked to tell you about the Hazard Analysis and Critical Control Point, or HACCP system, as it relates to meat and poultry inspection. This is an exciting time for us.

Before doing so, however, I'd like to take a few moments to describe recent developments in the Administration's Food Safety Initiative.

FSIS operates under the authority of the Federal Meat Inspection Act, the Poultry Products Inspection Act, and the Egg Products Inspection Act. FSIS sets standards for food safety and inspects meat, poultry, and egg products produced domestically and imported. Our mission is to protect the public health and safety.

Recently, we have broadened our food safety strategy to cover the entire farm-to-table continuum. Much of the support for our efforts has come from the White House, under President Clinton's Food Safety Initiative. The initiative focuses on six major areas: 1) the development of a nationwide early-warning system for foodborne illness; 2) improvement in risk-assessment capabilities through an interagency consortium, that will coordinate and guide overarching Federal risk assessment research related to food safety; 3) development of new research methods to detect the presence of pathogens in food, enhance our understanding of how pathogens become resistant to food-preservation techniques and antibiotics, and develop new technologies for the prevention and control of pathogens; 4) improvement of inspection and compliance by agencies responsible for food safety, including greater use of HACCP; 5) development of a public-private partnership to develop and encourage dissemination of standard food safety messages; and 6) initiation of long-range strategic planning to address public health, resource and management questions facing Federal food safety agencies.

The President directed the USDA, Health and Human Services (HHS), and the Environmental Protection Agency (EPA) to consult with all interested parties to identify and report on specific steps to improve the safety of the food supply, and to ensure it remains the safest in the world. Two public meetings were held to solicit input from States, consumers, producers, industry, universities, and the public. The final report, released May 12, 1997, reflects the interactive process. It outlines steps USDA, HHS, and EPA will take to reduce foodborne illness.

universities, and the public. The final report, released May 12, 1997, reflects the interactive process. It outlines steps USDA, HHS, and EPA will take to reduce foodborne illness. These more recent developments build on our earlier efforts in this arena that have already come to fruition with the publication of our landmark rule on Pathogen Reduction and HACCP Systems, on July 25, 1996. This rule is the centerpiece of our new regulatory approach and will enable us to step confidently into the 21st century. The rule mandates HACCP, sets certain food safety performance standards, establishes testing programs to ensure that standards are met, and assigns new tasks to inspectors to enable them to ensure regulatory performance standards are met. The final rule applies to 6,500 federally inspected and 2,550 state inspected slaughter and processing plants in the U.S., as well as to countries who export meat and poultry products to the U.S. Although egg products are not covered by the rule, yet, we have developed a strategy, including HACCP, to improve the safety of eggs and egg products. We'll extend this system to cover eggs, eventually.

What is HACCP? HACCP is a process control system designed to enable industry to identify and prevent microbial, chemical, and physical hazards in food production, and correct deviations as soon as they're detected. It is based on the premise that the logical and proven way to ensure safe food and prevent problems is to control the process from beginning to end, rather than detecting problems at the end of the line. HACCP is comprised of 7 steps: 1) Hazard analysis; 2) Critical Control Points; 3) Establishment of Critical Limits; 4) Monitoring Procedures; 5) Corrective Actions; 6) Record Keeping; and 7) Verification Procedures.

Under the new rule, businesses that produce food are accountable for its safety. They need to maintain control over their systems for sanitation, sanitary dressing, and food processing. They need to ensure their systems include established procedures to prevent, eliminate, or reduce to an acceptable level hazards that may occur. To accomplish this, all plants must develop and implement a HACCP plan for each process, and conform to the principles of HACCP.

This is not a "one-size-fits-all" approach. Rather, each plant designs its own plan to meet USDA regulatory requirements. Each plan must be transparent and self-contained. The plans are required to address those Critical Control Points (CCP's) that affect product safety as opposed to those related to economic adulteration, labeling, or quality concerns. Other inspection measures remain in place to address those areas. This is regulatory reinvention in action.

HACCP implementation is occurring in phases, to take into account plant size. The largest plants, those with 500 or more employees, were required to have HACCP systems in place by January 26, 1998. These plants account for about 75% of slaughter production and 50% of processed product production. Small plants, those with 10 or more employees but fewer than 500 employees, are required to implement HACCP by January 25, 1999. Very small plants, those with fewer than 10 employees or annual sales of less than \$2.5 million, are required to implement HACCP by January 25, 2000.

As of February 4, 1998, HACCP has been implemented in 297 large plants throughout the U.S. Over 2000 inplant (FO) personnel have undergone extensive HACCP training. Based on reports from across the country, the training has been extremely effective, and has enabled inspectors

and supervisors to carry out their oversight responsibilities with even greater detail and scrutiny than in the past. Inspectors are verifying that HACCP plans conform with regulations, verifying how the plants are carrying out their hazard prevention and sanitation responsibilities, documenting failure to meet regulatory requirements, and enforcing regulations when a plant is not in conformance with regulatory requirements.

Prior to conducting any verification activities, FSIS inspectors participate in a plant awareness procedure. FSIS initiated this procedure, whereby inspection personnel meet with plant management and develop a working understanding of each plant's HACCP plan. This plant awareness procedure has facilitated communication between plant management and inspection personnel concerning how the HACCP system was designed to function in each facility. When questions have arisen, our Technical Service Center in Omaha, Nebraska has played a strategic role in support of FSIS personnel.

USDA inspectors will continue to be present every day in plants, to verify a plant's compliance with its HACCP plan, and take direct action when necessary. Our inspectors have lost no authority on the production line. They continue to have authority to take action to ensure that establishment HACCP systems can produce product that meets food safety regulations, and to assure that affected product is disposed of properly.

Enforcement

As a logical nexus, the changing roles of the regulated industry and inspection have stimulated changes in the compliance functions of FSIS. The conceptual shift from government to industry and overall pro-active approach to food safety and process evaluation has enhanced the importance of an effective enforcement program. Our new inspection system has been strengthened by integrating the work of our inspectors with our Compliance Staff. This enables FSIS to use a team approach to plant enforcement actions and to respond quickly to situations, to determine whether corrections have been effective.

When HACCP or sanitation system failures occur, compliance officers assist inspectors by reviewing documentation of failures of plant control systems and help ensure appropriate due process when enforcement actions are needed. This includes suspending the use of inspection marks, suspending or withdrawing inspection, or holding suspensions in abeyance, and closing plants.

While Pathogen Reduction and HACCP regulations provide the industry with enormous flexibility to develop and implement innovative measures for producing safe foods, they also impose clear and unequivocal responsibilities for preventing contamination by pathogens and other hazardous substances. Industry is accountable for food safety. This means that inspectors and compliance officers must now verify industry practices and take enforcement actions when a plant's control systems fails to meet regulatory requirements.

Essentially, with HACCP, FSIS has linked a plant's ability to control processes and the eligibility of their products to bear the marks of inspection. If a plant cannot demonstrate the effectiveness

of its system, a withholding action will be issued, which could lead to a formal action to withdraw inspection, permanently.

We are committed to a systematic process to ensure safe food for consumers. HACCP provides us with tools to stop operations where there is a pattern of repetitive deficiencies, and insist on preventive measures to improve food safety before a plant can reopen. Meat and poultry plants must therefore continually and consistently demonstrate to FSIS inspectors that product is not adulterated, and that plant sanitation and process control systems prevent adulteration. They must also demonstrate truthful and accurate record-keeping. They need to verify that their control measures have worked, and that their products are safe and wholesome.

Where We're Going: Inspection Reform

Although we have made significant progress with HACCP and other aspects of the Pathogen Reduction rule, we are committed to continuing to improve our traditional inspection program for meat and poultry, and continuing to address other areas of food safety in the farm-to-table continuum. Changes in inspection methods and focus will benefit us all. However, the PR/HACCP rule is not the end of the line; there's still a lot for us to do. I'd like to now share some of our new initiatives with you.

First, we plan on continuing to improve our inspection system through experimentation with new models for in-plant slaughter inspection. These models will provide the same level of protection, but allow some inspection resources to be reallocated to food safety tasks off-line in slaughter plants, to new food safety tasks in processing plants, and during the distribution of meat and poultry products once they leave the plant.

The HACCP-based Inspection Models Project will describe for slaughter and slaughter processing plants that have implemented HACCP, what alternative inspection models FSIS could use that would enhance food safety accountability and maintain the other consumer protection accomplishments of the present system. Today, plants must develop HACCP systems around our ante and post mortem inspection stations. Plants participating in this project will be able to develop HACCP through all aspects of the production system, including those presently constrained by our inspection activities. In other words, we would still perform carcass-by-carcass examinations, but how we do the examinations may differ.

Second, we are interested in systematically focusing on conditions and practices during distribution that may contribute to the growth of pathogens. "In-distribution" aspects of food safety include transportation, out-of-plant locations, storage, commercial kitchens, retail stores, restaurants, hotels, and other institutions. These are vital links in the farm-to-table food safety continuum. With regard to transportation and storage of meat and poultry products after they leave the FSIS inspected plant, we believe the federal government has a responsibility to set standards regarding such inspection matters, and we have been working with FDA on this issue.

Regulatory requirements for in-distribution food safety may focus on meeting time and temperature requirements. These, combined with in-plant regulatory requirements for zero fecal

contamination, form the foundation of a system that produces safe and wholesome food. We are currently examining the relationship between in-plant and in-distribution regulatory requirements and enforcement locations, to see how we can most efficiently and effectively redeploy our resources from areas of other consumer protection, to focus on food safety, ensure standards are met, and to assure that the public gets the maximum return from its investment in food safety.

Third, we are concerned that small and very small companies that are scheduled to implement HACCP in 1999 and 2000 have the necessary technical guidance to help them prepare for implementation. As part of our Small Plant Demonstration Project, we have recently announced the availability of thirteen generic HACCP models to serve as guides in developing plant-specific HACCP plans at the lowest possible cost. These models are roadmaps for developing HACCP plans.

In addition, we're in the process of revising two publications: "Guidebook for Preparation of HACCP Plans," and the "Meat and Poultry Products Hazards and Control Guide." These two publications were reissued for public comment, along with HACCP Model Plans. The public comment period has closed and we're in the process of considering the comments prior to revision.

And finally, fourth, we are looking at passing new regulations. For example, we published our "Proposed Rules of Practice" in the Federal Register, just last month. (January 12, 1998) These proposed rules are intended to supplement existing rules of practice, but clarify the responsibilities of a plant regarding refusal, suspension, or withdrawal of inspection services when the Agency determines that a plant's HACCP systems are inadequate or ineffective, or a plant is not meeting other regulatory requirements associated with the PR/HACCP rule. In addition, the Clinton Administration has asked Congress for authority to fine companies for violations of food safety standards.

Conclusion:

In conclusion, inspectors will become more important in the FSIS of the future, albeit their jobs will most likely differ somewhat from what they perform today. The cooperative relationships we're forging with other federal agencies, state and local governments, consumers, and the industry, in addition to the new roles our inspectors are playing, we believe, will lead to a safer food supply. Accountability and responsibility are key in these efforts.

These philosophies extend beyond our domestic borders. Any government exporting meat and poultry products to the United States will be required to meet our standards. A foreign country must demonstrate the equivalency of its inspection program before its products will be allowed into the U.S.

HACCP provides a logical and science-based framework for a food safety regulatory system in which inspection, enforcement, and technological resources are targeted to the most significant food safety hazards. In conjunction with regulatory reform and reorganization to deploy

available resources efficiently and effectively, HACCP presents us with a "win-win" situation. For consumers, HACCP implementation means safer food and less foodborne illness. For animal producers, HACCP implementation provides you with new opportunities to provide cleaner and safer livestock and poultry to the food processing sector. Finally, for regulated industry, HACCP implementation means you have the opportunity to prove your commitment to and accountability for providing the safest food in the world.

We know there is no silver bullet that guarantees food safety, and that consumers must remain vigilant and continue to follow safe meat and poultry handling labels and practices. However, this new system is a victory for American consumers, and we at FSIS are committed to making HACCP work.

DELIVERING SAFE FOOD TO CONSUMERS

Jill Hollingsworth, DVM
Vice President, Scientific and Technical Services
Food Marketing Institute

My name is Jill Hollingsworth, and I am the Vice President for Science and Technical Services at the Food Marketing Institute. The Food Marketing Institute (FMI) is a nonprofit association conducting programs in research, education, industry relations and public affairs on behalf of its 1,500 members, including food retailers, wholesalers and their customers.

First, I want to share with you some statistics and facts about the food retail industry. I know many of you attending this conference are economists, and I want to give you as much data to mull over as I give to the food safety groupies who are here to listen to food safety information.

According to FMI's *Supermarket Facts*, in 1996 there were approximately 127,000 grocery stores in the U.S. with total sales in excess of \$425 billion. (This includes supermarkets, convenience stores (without gas) and wholesale club (supermarket items only)).

Consumers in the U.S. spend 8.7% of their weekly income on food, as compared to Canada (10.5%) and Japan (20.8%). In 1996, consumers spent \$546.5 billion dollars on farm foods; of that, \$327.5 billion was food consumed at home.

USDA inspected products still account for a large portion of the American consumers food choices — last year, the U.S. produced about 25 billion pounds of beef and over 28 billion pounds of poultry.

One of the fastest growing segments of the retail industry is organic foods — organic food sales are forecast to increase at a rate of 20% annually. Organic agriculture has increased from \$78 million in 1980 to \$3.5 billion in 1996. Another trend is Meal Solutions, also known as Home Meal Replacement. U.S. consumers are increasingly making the decision to purchase freshly prepared meals, rather than ingredients to prepare meals at home. The supermarket is now in the food service business — a take-out restaurant that brings with it a whole new array of food safety challenges.

That leads us into the topic of food safety. The '90s have been the decade of food safety, and looking to the year 2000, it is unlikely we will see anything other than an even greater emphasis placed on the safety of the food we eat.

You've heard all the numbers of foodborne disease estimates. According to ERS, the estimated cost from medical expenses and lost productivity for food borne disease caused by 7 of the most

common pathogens during 1993 was between \$5.6 and \$9.4 billion. We have all heard the message loud and clear, and we are responding.

The food retail industry is the direct link to the consumer, and providing safe and wholesome food is the primary goal of retailers. Consumers expect retailers to provide safe products, and hold them accountable for anything less. That is why the retail industry has a major stake in any initiatives to ensure food safety, and we are in full support of the President's Food Safety Initiative.

The food industry has an even greater stake in safe food than does the government. The retailers know more about their business than any one else — that is how it should be. But that is also why no one can make that system better and safer than the people who know it inside out. The government should seek partnerships with the industry if they are serious about making changes.

Regulating and mandating change does not buy commitment. We have seen examples where imposing “food safety by law” can result in industry complying out of fear of violating the law rather than working together to make the important, proven changes that will lower the risk of food borne disease.

An example of how effective a government-private partnership can be is the Fight Bac campaign. This educational effort demonstrates how beneficial programs can be when they are done with the industry and not to the industry.

The retail food industry has taken a lead in advancing food safety. Guidelines for receiving, storage, temperature control, employee hygiene and sanitizing have been established and are in use. The retail industry has taken a strong position in support of the Food Code, which is being adopted by more and more states. Although more can and must be done to continually improve the safety of our food supply and reduce the risk of illness, we believe the food industry — all segments of the supply chain — are up to the task. Great strides have been made, and there is no evidence that this momentum is slowing down. Food safety is #1....

But we must not forget there are other important agriculture issues to be addressed. Consumers in the U.S. also expect an abundant, affordable and quality food supply. According to a survey in *Progressive Grocer*, 93% of consumers rated cleanliness as the #1 reason for choosing a grocery store or supermarket. And according to the Food Marketing Institute's own consumer research, *TRENDS in the United States: Consumer Attitudes and the Supermarket*, for over a decade almost all (98%) consumers have ranked high quality fruits and vegetables as one of the primary reasons for choosing a particular supermarket. We cannot jeopardize affordability, availability and quality without proven food safety benefits.

Safety first – but let's keep agriculture and the food industry healthy too.

**The U.S. Beef Industry's Commitment to Beef Safety
Beef Industry Food Safety Council**

Submitted by Gary Weber
Director of Regulatory Affairs
National Cattlemen's Beef Association

Introduction

Food safety is nothing new to the beef industry. What is new is the collaborative effort of every segment from farm to table to develop and find new ways to bring each consumer the safest product available. Beef safety is more than an expectation, more than the effort of one single entity — it is the sum of the entire beef production system, from farm to table.

Beef safety has been and will continue to be a dominant feature of the beef industry. But food safety cannot be addressed without considering the route that beef makes to the consumer's table. This food chain begins on the farm and extends through processors, distributors and ends with retail and food service establishments having direct contact with consumers. While important food safety trends are impacting the entire beef production system, the final dimension in meeting beef safety usually takes the form of optimizing the use of interventions and control points not only within individual segments but within the entire system as well.

For these reasons, the entire beef industry is serious about developing an effective science-based industry-wide approach. Every segment of the beef industry must unite behind effective programs aimed immediately at solving the problem of *E. coli* O157:H7 in the beef supply, and aimed longer-term at solving the problems presented by other hazards already existing or that may evolve in the future. The industry must also strive to align the programs and policies of the government to support and enhance these efforts. This effort requires everyone involved to rethink their current approaches to beef safety and adopt new measures and collaborative efforts designed to support a comprehensive system spanning from farm-to-table.

Statement of Principle

The Beef Industry Food Safety Council is committed to developing industry-wide, science-based strategies to solve the problem of *E. coli* O157:H7 and other foodborne pathogens in beef. The Council will accomplish this by identifying, funding and prioritizing research priorities from farm to table; developing programs to help industry segments operate in today's business environment; speaking with one voice in seeking regulatory and legislative solutions; developing consumer education programs; and developing and implementing industry education programs to assist in the transfer of technology into the market place.

Overview

The U.S. beef industry is committed to producing safe food. Food safety issues will continue to generate the need for change, both to respond to public concerns and to provide policy makers with scientific data as a basis for sound, reasoned judgments. As new and creative foods become more common, continuing efforts will need a strong foundation to assess the complexity of interactions of food components as they relate to food safety.

To this end, the industry and the scientific community realize that further improvements can be made through a collaborative effort based upon:

- The use of science-based pathogen intervention strategies to enhance sanitary processes that include effective Hazard Analysis and Critical Control Points (HACCP) which are based on microbiological testing protocols to verify process control.
- The principles of prevention and risk reduction from farm to table that include effective monitoring and intervention strategies.
- The understanding by each segment of the beef food chain of the risks involved and the steps needed to ensure a safe beef experience.

The beef industry believes that the optimal system will have a food safety net extending from farm to consumer. To this end, the Council was formed, made up of industry executives, beef producers, university and government scientists, industry association executives and experts that represent each segment in the beef food chain. This cooperative effort clearly displays a deep commitment for further action to enhance the safety of the beef supply.

Strategy

The Beef Industry Food Safety Council provides input from producers, packers, processors, distributors, restaurants and food retailers to form a coordinated frame of reference for action. The strategy of implementing a food safety plan must be responsive to the competitive and customer-driven dynamics of each segment. By matching the right objective with each segment, the beef industry builds on current safety efforts through an industry-wide strategy. Through these cooperative efforts, the industry gains access to enthusiasm, expertise and needed resources for strategy execution and implementation.

Today, the beef industry is challenged to recognize and address an expanding and increasingly complex food safety agenda that must serve an even more complex food delivery system. Meeting these new and complex needs requires both interdisciplinary and multidisciplinary efforts.

To address beef safety, the strategic plan divides the industry's initiatives into five critical areas, which reflects not only the span of the industry from farm to table, but the multidimensional nature of beef safety that includes the action of regulatory agencies and policy makers. The five critical areas are:

- Research/Science

- Crisis Communications
- Public Policy
- Industry Education
- Consumer Education

Listed below are the priorities established by the Beef Industry Food Safety Council to address beef safety issues throughout the industry. The overall focus of this collective effort is based on prevention and emphasizes information exchange among all segments of the food chain.

Research/Science

Research is essential to improve monitoring, to identify intervention strategies and to evaluate process effectiveness for every critical step within the food safety net from farm to table. However, more data are needed to effectively implement a farm-to-table prevention system.

Seven key segments in the farm-to-table continuum need to be considered with regard to research accomplishments and voids: pre-harvest, beef carcass conversion, beef carcass break-up and trim generation, ground beef processing, food service/retail and pathogen intervention strategies. Of these, the Council identified pre-harvest, beef carcass break-up and trim generation, ground beef processing, and food service/retail as high priority areas needing further research.

Pre-harvest

The presence of *E. coli* O157:H7 in the general cattle population suggests that preventative strategies prior to harvest may potentially reduce the incidence of *E. coli* O157:H7. Efforts to establish points critical for incidence reduction are needed to address the efficacy of pre-harvest interventions and strategies.

Initially, however, more fundamental studies are required as a necessary prerequisite for directing efforts towards pre-harvest strategies to reduce the incidence of *E. coli* O157:H7. The priorities for pre-harvest research are:

- Gain a better understanding of the host/pathogen relationship to aid in the identification of potential pre-harvest critical control points and intervention strategies.
- Identify production and management practices that influence growth, shedding and spread of *E. coli* O157:H7.
- Gain a better understanding of the ecology of *E. coli* O157:H7.
- Develop a “white paper” for the industry on current knowledge of *E. coli* O157:H7 in the preharvest segment of the beef chain. (short term priority)

Beef Carcass Break-up/Trim Generation

Beef carcass fabrication and trim generation provide important avenues for strategically improving present measures for preventing contamination/recontamination and minimizing the growth of existing contamination. The importance of focusing on this process stems from the increase the surface area as carcasses are fabricated into a diverse array of beef products along with the concomitant generation of beef trim.

There is a tremendous need to refine preventive strategies to reduce the incidence of *E. coli* O157:H7 that takes into account the resources utilized in this process. These include employees, incoming raw materials, equipment, temperature and protocols for sanitation of equipment and facilities. The diversity of resources at this stage of beef processing present challenges to microbial monitoring systems, and preventive and intervention procedures that provide effective HACCP strategies to reduce the impact of bacterial pathogens. The priorities for this research area are:

- Develop microbial verification systems/guidelines for key critical control points. (short term priority)
- Evaluate and develop intervention options for beef trim.

Ground Beef

The production of ground beef presents an important opportunity to the industry for reducing the incidence of *E. coli* O157:H7. The diversity in raw materials sources and the complexity in the points of production, whether packer, retail or foodservice, offers a challenging opportunity to the industry.

Ground beef is processed at a multitude of production points that include packer, grinder/purveyor, distributor and even foodservice/retail establishments. The sources of raw materials for ground beef processing can also originate from within the facility, from outside sources or a combination of both. Thus the overall scheme for ground beef production is complicated.

The complicated nature of ground beef production, however, can be addressed through appropriate HACCP and intervention strategies. Key research is needed to develop and refine interventions and monitoring protocols. The research priorities needed are:

- Microbial testing is integral to the verification process steps prior to the grinding of trim into ground beef. (short term priority)
- Develop testing protocol for *E. coli* O157:H7 to enhance definition of lot sizes. (short term priority)
- Develop irradiation guidelines for ground beef products (dose/usage/dose per micro-load/packaging types, etc).
- Enumeration of micro loads in ground beef products for *E. coli* O157:H7 and Salmonella. (short term priority)

Food Service/Retail

There are no other points of delivery that are closer to the consumer than foodservice or retail establishments. The process of making, transporting and serving prepared beef meals, as in a restaurant or commissary, or though the sale of individual beef cuts or products, are important points for monitoring and establishing prescribed actions to reduce the incidence of *E. coli* O157:H7.

Industry education efforts have established programs for these points of delivery. Additional research is needed however to provide further opportunities for pathogen risk reduction. The research priorities are:

- Develop a “white paper” for the industry on thermal death-time curves for *E. coli* O157:H7. (short term priority)
- Develop microbial profile for needle/mechanical tenderized/injected beef products (retail and food service). (short term priority)
- Develop a microbial profile for all types of retail ground beef products. (short term priority)

Crisis Communications

Crisis communications to ensure consumer safety establishes a clear plan for the beef industry to communicate rapidly between affected companies, organizations, regulatory agencies, public health officials and health-care professionals. Recent outbreaks emphasize the role and responsibilities for ensuring consumer safety through fair, accurate and timely information from all segments of the industry.

Clear lines of communication between regulatory agencies, companies and their immediate customers provide the consumer a clear portrayal of the situation and a choice of preventive measures. Health care professionals and public health officials may further these efforts through their communication endeavors. However, the multitude of communication points necessitates the need for a clear plan of action to protect the consuming public.

The Council determined the following priorities be investigated for eventual funding and implementation:

- Establish a comprehensive communication plan to implement during a crisis that ensures a rapid and coordinated response by the affected company, their customers, industry organizations and regulatory agencies to uphold consumer safety as the overarching priority for action.
- Utilize the educational activities of Consumer and Industry Education to facilitate a collaborative effort between industry segments in reassuring consumers of the safety of the beef supply.

Public Policy

The implementation of HACCP bolsters a meat and poultry inspection system that has served the consumer and industry with an increasingly safe beef supply. But new pathogens, such as *E. coli* O157:H7, create new challenges not only for present systems of producing, processing and handling, but for the regulatory approach for monitoring the entire process as well.

The current regulatory approach should be a science-based industry-encompassing effort to meet the ever-changing needs and products that consumers demand. The regulatory effort will be preventative in nature and further assist the industry in transferring and implementing pertinent technologies, monitoring procedures and intervention strategies to protect the consuming public.

The Beef Industry Food Safety Council established that the industry will speak with one voice in seeking regulatory and legislative solutions to address food safety policies and regulations that provide an environment for enhancing food safety. The following priorities were identified for consideration and implementation:

- Microbiological sampling and testing procedures should be done at the points in the production process where they will provide the most useful information in controlling product quality and safety.
- Food Safety Inspection Service procedures for handling recalls need to be clearly defined and predictable.
- If HACCP is to succeed as a prevention-based food safety program, it needs to be based on a common understanding among industry and inspectors of HACCP principles.

Industry Education

Industry educational programs assist in transferring technologies and establishing strategies that result in safer products and in expanding the good manufacturing procedures utilized by food handlers and producers. To this end, current industry educational programs need to be expanded and coordinated to encompass a prevention-based system that can effectively meet the needs and diversity of beef producing segments from farm to table.

As industry education efforts are considered, effective strategies must factor in the behavior of a network of related segments, each having somewhat different motivations, communications and management models. Despite their differences, these segments share a set of broad-based principles and goals. Previous beef safety efforts have shown a strong consensus on the demands of the marketplace. To capture the complexity of beef safety, the beef industry must provide a multidimensional industry-wide educational effort.

New expectations, new opportunities and problems, new linkages, changing resources and origins are all features of an educational program that would facilitate the reduction in foodborne illness. The Council identified the following priorities for further study and eventual funding:

- The beef industry desires to have a body or organization that enhances dialogue and exchange of food safety information among all segments from farm to table.
- Utilize educational activities for all segments from preharvest to postharvest to expand and enhance the safety of the beef supply using allied associations and organizations.
- All industry communication efforts should deliver a clear and substantive message that is consistent between consumer and industry efforts.

Consumer Education

Consumers' food handling/consumption is the final critical control point in the food safety process. Existing industry and government education programs, and identified information voids lead to a strategy for effectively implementing a two-prong communication effort that creates greater awareness of proper food handling and preparation techniques, and informs consumers of the industry's efforts in addressing food safety at each segment.

The Council supports a coordinated, proactive, industry-wide food-safety education effort for consumers. The effort should focus on all safe food handling practices in conjunction with beef-specific preparation/handling information as a part of that total message. Communication efforts should emphasize the benefits derived by changing food safety behaviors rather than avoiding risk: it is important for efforts to be positive and not to create concern.

The feelings of consumers are paramount to the industry. Yet a comprehensive effort to inform the consumer of the industry's interest in providing a safe beef experience has never been conducted to communicate the food safety changes taking place in the beef industry in route to the consumer's table.

The Council recommended the following priorities for further consideration and eventual funding:

- Support government and industry-wide, collaborative food safety efforts in consumer education and communications.
- Communicate about the industry-led farm-to-table efforts and their results to facilitate a positive change in consumer attitudes about the safety of beef.
- Conduct a campaign for consumers on their role as the "last critical control point" to change food handling/consumption behavior.

Immediate Industry Priorities

The Beef Industry Food Safety Council identified areas that deserve immediate industry attention. Near term priorities, those to be implemented as soon as possible, were clearly identified for research. Every working area had priorities that should be implemented as soon as possible to rapidly move the industry toward improving the safety of the beef supply and enhance efforts to communicate with the industry's consumers.

These priorities will be further considered by the steering committee of the Beef Industry Food Safety Council in order to consider appropriate actions for a rapid and coordinated implementation plan. The identified priorities and implementation plan will be discussed by the Council in March, 1998, to consider industry-wide execution of a strategic plan, its budget and funding strategies.

"A TIME TO ACT" - HIGHLIGHTS OF A REPORT OF THE USDA NATIONAL COMMISSION ON SMALL FARMS

Jennifer Yezak Molen
Director, National Commission on Small Farms

The purpose of the USDA National Commission on Small Farms was to recommend to the Secretary of Agriculture a national strategy to ensure the continued viability of small farms, including specific measures the public, nonprofit and private sectors can take to enhance the economic livelihood of small farms. The Commission was an outcome of the USDA Civil Rights Action Team. In July of 1997, Secretary of Agriculture Dan Glickman appointed a 30-member National Commission on Small Farms to examine the status of small farms in the United States and to determine a course of action for USDA to recognize, respect, and respond to their needs.

The Commission began its work in Memphis, Tennessee, on July 28. Subsequent public hearings and meetings were held in Sioux Falls, South Dakota, on August 21 and 22; Washington, DC, on September 10 and 11; and Sacramento, California, on September 15 and 16. Three smaller meetings were held in Albany, New York; Albuquerque, New Mexico; and Portland, Oregon. The results of the Commission's work are embodied in the 146 recommendations in their report, *A Time to Act*.

When Secretary of Agriculture Bergland's report, *A Time to Choose*, was published, nearly 20 years ago, it warned that "...unless present policies and programs are changed so that they counter, instead of reinforce or accelerate the trends towards ever-larger farming operations, the result will be a few large farms controlling food production in only a few years."

Looking back now nearly 2 decades later, it is evident that this warning was not heeded, but instead, policy choices made since then perpetuated the structural bias toward greater concentration of assets and wealth in fewer and larger farms and fewer and larger agribusiness firms. The Commission recognized that Federal farm programs had historically benefited large farms the most. Today, we have 300,000 fewer farmers than in 1979, and farmers are receiving 13 percent less for every consumer dollar. Four firms now control over 80 percent of the beef market. About 94 percent of the Nation's farms are small farms, but they receive only 41 percent of all farm receipts.

Like most major industries, the ownership and control over agricultural assets is increasingly concentrated in fewer and fewer hands. Farmers have little to no control over setting the price for their products. The basic tenets of a "competitive" market are less and less evident

in crop and livestock markets today.

The recent passage of the 1996 Federal Agricultural Improvement and Reform Act was a watershed event in the history of Federal farm policy. It signals the reduction and eventual elimination of government intervention in commodity markets as a means to provide income and price stability for the farming sector.

Agricultural technologies have emerged that use ever greater levels of capital to enable fewer people to produce the Nation's food. As a result, income and opportunities have shifted from farms to the companies that produce and sell inputs to farmers. As farmers focused on producing undifferentiated raw commodities, food system profit and opportunities were shifted to the companies that process, package, and market food. Consequently, from 1910 to 1990 the share of the agricultural economy received by farmers dropped from 21 to 5 percent.

The pace of agriculture industrialization has quickened. The dominant trend is a few, large, vertically integrated firms controlling the majority of food and fiber products in an increasingly global processing and distribution system. The Commission believed that if we do not act now, we will no longer have a choice about the kind of agriculture we desire as a Nation.

A Vision for Small Farms in the 21st Century

The National Commission on Small Farms set its choice for the future of American agriculture. This is their vision:

“Small farms have been the foundation of our Nation, rooted in the ideals of Thomas Jefferson and recognized as such in core agricultural policies. It is with this recognition of our Nation's historical commitment to small farms that we renew our dedication to the prominence of small farms in the renewal of American communities in the 21st century. Black, Hispanic, Native American, Asian, women, and other minorities have contributed immensely to our Nation's food production and their contributions should be recognized and rewarded.

It is our resolve that small farms will be stronger and will thrive, using farming systems that emphasize the management, skill, and ingenuity of the individual farmer. We envision a competitive advantage for small farms realized through a framework of supportive, yet responsible, government and private initiatives, the application of appropriate research and extension, and the stimulation of new marketing opportunities. As small farms and farmworkers succeed in this nurturing environment, not only will they continue their

valuable contribution to the Nation's food supply, but they will also fuel local economies and energize rural communities all across America. In the process of flourishing, small farms will contribute to the strengthening of society, providing communities and the Nation with opportunities for self-employment and ownership of land, and providing a cultural and traditional way of life as well as nurturing places to raise families.

We emphasize public policies that recognize the value of small farms and actively encourage their growth and continuation. These policies are essential to the realization of this vision; so too, are policies that recognize and reward the contributions of farmworkers and their families. Toward this end, the Commission has articulated goals and made specific recommendations to guide the decision-making of the Secretary of Agriculture, the Executive Branch and Congress into the next century."

This vision is focused on those farms with less than \$250,000 gross receipts annually, on which day-to-day labor and management are provided by the farmer and/or the farm family that owns the production or owns, or leases, the productive assets.

Policy Goals for Our Nation's Small Farms

The Commission outlined 8 policy goals for a national strategy for small farms. I will briefly review each goal and highlight recommendations from each goal.

Policy Goal 1: Recognize the importance and cultivate the strengths of small farms

Research - USDA's Research, Education and Economics Mission Area should design and implement a small farm research initiative dedicated to optimizing the labor and ingenuity of small farm operators and the biological assets of their farms using less capital-intensive investments.

Credit - USDA should re-commit itself as the "lender of last resort" by focusing greater attention to serving the credit needs of small, minority, and beginning farmers; reversing the shift to guaranteed loans; and accelerating action on pending credit regulations. Congress should repeal the provisions that prohibit farmers who have previously had "debt forgiveness" from receiving any future USDA loans or credit assistance.

Program Bias - USDA policies, programs, and regulations should be reviewed to identify program rules and regulations that are either intentionally or unintentionally biased against small farms, including the Environmental Quality Incentives Program, the Business and Industry Loan

Program, and Forestry Stewardship Programs.

Policy Goal 2: Create a framework of support and responsibility for small farms

Leadership and Support - Establish an Administrator of Small Farm Programs who reports to the Secretary and has Senior Executive Service status.

Policy - USDA should develop a Department-wide Small Farm and Ranch Policy that encompasses the vision and the guiding principles set forth by the Commission and that must be reflected in the services, programs, and materials delivered by each agency.

Policy Goal 3: Promote, develop, and enforce fair, competitive, and open markets for small farms

Cooperatives - USDA's Rural Business – Cooperative Service should give priority to the development of farmer-owned, value-added cooperatives and farm-based businesses where profits flow to and within the community; where wage-laborers are paid a living wage; where efforts results in more local and regional competition in the cash market, not less; and where natural resource stewardship is rewarded through the market.

Market Enforcement - The Secretary should propose legislation clarifying the authority of the Grain Inspection, Packers and Stockyards Administration (GIPSA) to prohibit discriminatory pricing on the basis of volume.

The Secretary should consider Federal production contract legislation to address issues such as contract termination, duration, and re-negotiation; prohibition against discriminatory practices; and responsibility for environmental damages.

The Commission endorses the proposed rule to prohibit packers from procuring cattle for slaughter through the use of a forward contract, and from owning and feeding cattle, with limited exceptions.

USDA should investigate the processing and retailing segments of the dairy industry to determine if excessive profits are being made at the expense of farmers and consumers.

Market Development - USDA should develop an interagency initiative to promote and foster local and regional food systems featuring farmers markets, community gardens, Community Supported Agriculture, and direct marketing to school lunch programs.

Policy Goal 4: Conduct appropriate outreach through partnerships to serve small farm and ranch operators

Farm Service Agency State Executive Directors, Rural Development State Directors, Natural Resources Conservation Service State Conservationists, and State Cooperative Extension program administrators should support the formation of farmer networks and mentoring programs for small farmers.

USDA should collaborate with and jointly fund community-based organizations to train people to be farmer advocates.

Educational efforts by the Risk Management Agency should address sustainable agriculture practices as a means of managing risk on small farms.

Policy Goal 5: Establish future generations of farmers

USDA should launch an interagency Beginning Farmer Initiative dedicated to researching, developing, and disseminating farm management models that emphasize low-capital investment, optimal use of skilled labor and management potential of beginning farmers, and high-value crop and livestock production and marketing methods.

The Farm Service Agency should clearly define the eligibility requirements for beginning farmers and recognize the farming experience of persons who were raised on family farms, who worked as hired farm labor, or who received training from apprenticeships.

Congress should authorize the Farm Service Agency to guarantee tax-exempt First Time Farmer Bonds used to make loans to beginning farmers and ranchers.

USDA should seek legislative authority to create a Beginning Farmer Matching Grant program for the purpose of supplying equity funds for entry farmers in lieu of loans.

Policy Goal 6: Emphasize sustainable agriculture as a profitable, ecological, and socially sound strategy for small farms

The USDA Office of Communications should conduct a communications campaign to inform farmers of the new farming strategies emerging from the 10 years of sustainable agriculture research.

The Secretary of Agriculture should support policies that preserve the grazing and water use rights of the small and traditionally underserved public land permittees.

USDA's Risk Management Agency should develop an affordable Whole Farm Revenue Insurance pilot project for diversified small farms using sustainable farming practices.

The Secretary should exercise restraint in approving exceptions to the 1,000 animal units eligibility limit on EQIP funding for livestock manure storage structures.

Policy Goal 7: Dedicate budget resources to strengthen the competitive position of small farms in American agriculture

Increase appropriations for the Sustainable Agriculture Research and Education (SARE) program by \$10 million each year over 3 years to reach \$40 million.

Increase the Outreach and Technical Assistance Program for Socially Disadvantaged and Minority Farmers (Sec. 2501) program to the current authorized level of \$10 million annually.

Increase funding to the maximum authorized levels of \$85 million for Farm Ownership Direct Loans and \$500 million for Farm Operating Direct Loans.

Increase Rural Technology and Cooperative Development Center Grant Program funding to \$20 million.

Ensure GIPSA appropriated funding at \$3 million for reorganization, \$1.65 million for increased staff, and \$750,000 for investigation into unfair market practices in the poultry industry.

Policy Goal 8: Provide just and humane working conditions for all people engaged in production agriculture

The President should establish an interdepartmental task force led by Secretary Glickman involving the Departments of Education, Labor, Health and Human Services, and Environmental Protection Agency, as well as the Internal Revenue Service and the Immigration and Naturalization Service, to address the laws, regulations, and enforcement affecting farmworkers.

A Farmworker Coordinator position should be created within the USDA Office of Outreach.

The Public Value of Small Farms

The dominant belief in agriculture is that large farms are more efficient than small farms. However, Professor Willis L. Peterson from the University of Minnesota found that factors other than size influence the unit costs in agriculture. Peterson asserts that "small family and part-time farms are at least as efficient as larger commercial operations. In fact, there is evidence of diseconomies of scale as farm size increases."

In addition, our economic accounting systems do not take into account the "hidden" costs of large farms. An agricultural system characterized by a limited number of large-scale farms does not take into account the loss of market competition when production is concentrated in oligopsonistic markets. The environmental consequences of concentrating a large number of animals in limited areas is rarely considered.

Small farms contribute more than farm production to our society. Small farms embody a diversity of ownership, cropping systems, landscapes, biological organization, culture, and traditions. Since the majority of farmland is managed by a large number of small farm operators, the responsible management of soil, water, and wildlife encompassed by these farms produces significant environmental benefits. Decentralized land ownership produces more equitable economic opportunity for people in rural communities, and offers self-employment and business management opportunities. Farms, particularly family farms, can be nurturing places for children to grow up and acquire the values of responsibility and hard work.

On more than one occasion, farmers who spoke at the public meetings referred to the Commission as "our last hope." It is with conviction and hope that the National Commission on Small Farms is asking the Congress and USDA to act on the needs of America's small farmers.

USDA Response

Secretary Glickman immediately appointed a Small Farm Action Team headed by Deputy Secretary Rominger when the report was provided to him. Other members on the action team include the heads of the following mission areas:

- Research, Education and Economics
- Natural Resources and Environment
- Rural Development
- Farm and Foreign Agricultural Services
- Marketing and Regulatory Programs
- National Office of Outreach.

Eight policy goal teams will be established to create action plans on all 146 recommendations and the work will be further guided by a group of small farm coordinators representing all mission areas and Department offices to carry out implementation of the recommendations. In September 1998, the Commission will reconvene to review the progress made by the Department on the recommendations.

The report can be found on the Internet at <http://www.reeusda.gov/agsys/smallfarm/ncosf.htm> and some copies are available today. Thank you for your interest and support.

VIABLE CREDIT FOR SMALL OPERATIONS

Don C. Guess
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First National Bank, Russellville, Arkansas

Contract farming has allowed farm families to remain on the farm. It has given them an opportunity to create a viable business and accumulate wealth by using prudent management practices, and the expertise and guidance of the company technical advisors. It has provided a standard of living that would not have been available to them on their small farms.

In the early to mid-60's, the lock and dam across the Arkansas River was nearing completion along with Interstate 40. A lot of our rural people were without jobs and unable to be gainfully employed in the Arkansas River Valley area.

A retired vo-ag instructor, by the name of Harold Snyder, had a vision to expand his small company and increase his contract poultry production in the Arkansas River Valley.

In the early stages, there was no automation. Therefore, it took the whole family to take care of the poultry houses. In those days there were only chicken growers and it was considered a way of life. Today it has evolved into a big business with houses being automated with very sophisticated equipment. It is now considered a business and not a way of life. In the early 60's, poultry housing and equipment cost 50 cents a square foot. Today, housing and equipment cost \$5.75 a square foot.

We currently have 5,500 poultry producers and 340 contract swine producers in Arkansas.

A producer is able to get into business with a relatively small amount of investment or without having a large amount of operating capital. The company supplies birds, feed, medication and technical support. They also provide all the marketing for the finished product.

We have people who are handicapped and have no formal or very little education that are able to provide a living for their family, educate their children, and have a higher standard of living as a result of contract farming. If it were not for contract farming, a lot of these people would be forced to go on public assistance.

In the beginning, the company produced broilers and hunted a market. Today, the company produces for a market. Having the market in advance enables them to place birds into contract farmers' houses on a systematic time frame.

The producer or businessman can make plans as to diversifying his operation because he is assured of five to six flocks per year, depending on the size of the bird produced.

The lender plays a vital role in the success or failure of this business. Many operations have failed because the lenders did not tailor the loan to fit the income stream and the needs of the farmer.

Five or six paydays a year will not match quarterly or monthly payments. If a loan is structured in such a manner, the farmer is unable to meet his obligations and becomes an absentee owner/operator on the farm and part-time jobs are needed to supplement the farm income. When this happens production levels of poultry goes down and income stream is also reduced.

It is also critical for the lender to work closely with the producer and tax preparer to make sure depreciation coincides with the amortization of their loan.

If accelerated depreciation is used then a lot of farms are forced to liquidate because the income stream is not sufficient to make payments, pay operating expenses, and income tax after buildings and equipment are totally depreciated.

Many farmers in our area have poultry houses and cattle as major sources of income. One member of that family works off-farm to help support family living. This is very common when the farm family wants to accelerate repayment of their farm debt. Then both members retire to the farm and have a very good income stream.

Most farmers do not have a conventional retirement plan, as most non-farm employment provides. This is a means of our rural families having a retirement plan.

Contract farming, be it swine or poultry, has its place in providing food for the world. With the producer, company, and lender working together as a team, it provides our farmers with a good business and not just a way of life. The largest single problem facing the company producer and lender is communication. If we could ever learn to communicate, we would solve most of our problems.

HOW SMALL FARMS COMPETE

Michael Duffy
Professor of Economics
Iowa State University

Introduction and Background

Good afternoon. I appreciate the opportunity to be here and to be part of this panel. I only have 20 minutes, so I will not be able to fully outline all of the thoughts and ideas presented in this talk. However, I will be happy to provide the background for material I present.

I was asked to participate because of testimony that I presented to the Small Farms Commission when it met in Sioux Falls. I have copies of that testimony for anyone who is interested. Much of my talk today will be drawn from the testimony that I gave there.

Before beginning I would like to present briefly the general ideas that I bring to my analysis of how small farms compete. I come from the Midwest so my examples and frame of reference will be from that part of the country. I was trained as an agricultural economist in the land grant tradition. I believe that everything is interconnected and that every choice we make involves trade-offs. I also believe that change is inevitable but that we can influence the direction of change. We are masters of our own destiny.

I believe that success involves at least three four-letter words that end in k: hard work, taking risk, and luck. Everyone should have the right to try, but none of us has the innate right to succeed. We should have opportunities but not guarantees.

There are four points that I emphasized before the commission. First, size and efficiency (as measured by cost of production) are not the same thing. My studies of data from the Iowa Farm Business Association lead me to conclude that for row crops the low point on the average cost curve is somewhere between 400 and 600 row crop acres. In swine production, the low point is approximately 1000 head marketed.

Agricultural enterprises exhibit what is called an L-shaped average cost curve. There are initial economies of size but these are captured sooner than most people realize. Farms are not getting bigger to lower cost of production. Most of the farmers I talked to agree that low-cost production can be achieved without large volumes of production. Their concern is access to markets.

A second point I made before the commission is that we do not know the extent, nature, or impact of multi-family farms. The Leopold Center for Sustainable Agriculture funded a phone survey of Iowa farmers during February and March of 1997. This survey found that 16 percent of the farms had more than one family involved in their management. Nineteen percent of the

farms reported being involved with another operation and that “other” operation for over 80 percent was a family member. Additionally, 14 percent of the farms reported receiving regular help; in over 90 percent of the cases it was help from a family member.

The concerns over small farms, family farms, and beginning farmers reflect uneasiness over the structure of agriculture. Currently the Census of Agriculture is the only measure available regarding the structure of production agriculture. The Census has been criticized for using \$1000 in sales as the limit for classification as a farm. Such criticism misses the point that multi-family operations are not even being considered. For example, one of my former student employees returned to the family farm where there are three siblings and the parents farming. Each of the siblings has enough sales on their own to classify as a farm but they all work for the home farm. The Census would count this as four farms; one large, owned by an older farmer, and three smaller farms run by younger people. This is one way to look at the situation but if family ownership is the issue then the question becomes: is this four farms or one? We don’t have a good way to measure these types of arrangements.

The third point, which shows I have a firm grasp on the obvious, is that agriculture has become capital-intensive with increasingly tight margins. This is illustrated by examining net farm income in Iowa as a percent of the gross farm income. The chart shows farm income both with and without the government programs. In the 1950s, net averaged 35 percent of the gross while over the last decade net has averaged between 10 and 20 percent depending on whether or not the government program payments are included. This means an Iowa farm has to produce two to three times the volume of the 1950s just to have the same level of income. This does not even account for the changes in farm lifestyle, especially among the children.

These three points lead to the fourth observation. Farms are getting bigger because they can. Growth is a goal because they need to expand in order to generate an adequate income, and because they are making room for more than one generation or family. It is important to keep these points in mind as we think about and discuss farm size and the structure of agriculture.

How Small Farms Compete

Small farms compete the same way that any farm competes; by having a farming system that is consistent with the goals and resources available.

Any farm operation has to consider three important items when deciding on the type of farming system to employ. First, it is important to know the goals and objectives of the farm.family. Underlying the goals and objectives are the values held by the decision-makers and the family. The goals and objectives provide a road map for decision-making and for assessing the success or failure of the operation and the desirability of alternatives available. The goals and objectives occur at various levels. There should be daily, short- and longer-term goals and objectives. I won’t spend any time defining or debating these terms. The point is that you need to know where you want to be before deciding which way to go.

The second thing necessary for any successful farm is to know the resources that are available. These resources can be classified in a variety of ways. One classification that is especially useful

when evaluating small farms is knowing the resources that are internal and external to the farms. The second classification is the familiar economic analysis division among land, labor, capital, and management. For example, the internal land would be owned land whereas the external would be land available for rent. Similarly, the farm has owned equity or borrowed capital available and on-farm labor versus hired labor.

We don't have time to go into a complete description of the resources and the various categorizations available. Suffice to say that each farm has a unique set of resources and that the way to compete is to farm based on the resources that are available. It is also important to note that the resources available to the farm will change over time. Therefore, the optimum farming system and the mix of resources will also change over time. A beginning farmer has labor and hopefully good management but little capital. Over time this will change to having less labor available (or desired) and more capital.

The switch to a more capital-intensive agriculture has removed much of the need for labor. As we continue to adopt technologies and systems that require less labor, we will inevitably have fewer, larger farms. As a society we are faced with the choice of continuing to pursue the capital-intensive course or a course that would allow more management-intensive strategies to be profitable. This is a point to which we will return shortly.

The third action that any farm needs to take is to carefully evaluate the options and alternatives that are available. Every farm, no matter what size, has options. We may not like them but there are always options. The most important thing is to utilize those options that are consistent with the goals and resources that are available. This could include either part- or full-time off-farm employment.

When considering options it is important to remember to make choices that will allow the most flexibility for future decisions. It is also important not to get lost in the forest because of the trees. There are so many options available and new technologies seem to be arriving at an increasing rate. Farm operators need to decide on a course and then proceed.

The decision-making steps for small farms are no different than for large farms. Small farms have a different mix of resources available but the correct decisions are still the ones that are consistent with the goals and the resources available.

Small Farm Options

The most important thing for small farms to remember is not to choose the same path or mix of resources as those used by large farms. Small farms have to focus on appropriate technology. I first heard this term used by a man named E.F. Schumacher in the 1970s book entitled, "Small is Beautiful." He argued that to be successful farmers needed to adopt the technologies that were appropriate for their mix of resources. The idea still holds true today in spite of the intervening technological innovations.

Small farms should try to capitalize on their unique attributes. Every farm, large or small, has a unique set of resources. Small farms have the ability to be more flexible than large farms. I feel

that this flexibility will offer a significant advantage in the future. Consumers are becoming more demanding with respect to quality and other non-price attributes. The new identity-preserved crops offer some alternatives where it could be easier for smaller farmers to capture the added value to maintaining segregated products.

There are several examples of specific technologies or farming options available to small farms. One example is hoop houses for swine. The hoop houses are a relatively cheap alternative that relies on natural ventilation and requires a different type of management than confinement systems. A recent comparison by the Midwest Plan Service estimated that the cost per pig space for a confinement unit would be approximately \$160 compared to a \$50 cost for hoops. The estimated difference in total cost of production is less than 1 percent.

The MWPS study shows very clearly the differences that exist with different technologies. The confinement system requires only .25 hours per pig whereas the hoops are estimated to require .4 hours. If capital is the constraint, a farmer will earn more with hoops than with a confinement, but if labor is the constraint then confinement is more profitable. The two systems also illustrate the difference between the quantity and quality of labor. In the confinement there is less total labor but the labor is spent more on the mechanical aspects of production while the hoop labor devotes more time to animal husbandry.

A complete discussion of the differences between hoops and confinement on risk, the environment, and so forth is beyond the scope of this talk. However, it is interesting to note that at least in Iowa, the farmers are ahead of the research community in understanding the problems involved with hoops and possible solutions.

Another example of a management-intensive farming option is found in the work of the Weed Management Issue team funded by the Leopold Center. This group is trying to identify alternative weed management techniques and weed population predictors that can be used in a total farm management system. They are truly looking for ways to better understand weeds rather than kill them. This is very much in line with the thinking of Aldo Leopold who considered "a weed as simply a plant out of place."

Increasing our understanding of weeds and their impact will increase the options and alternatives that are available. This is in direct contrast to the current trends in weed management for soybeans in Iowa. In 1989, 84 percent of the soybean acres in Iowa were cultivated at least once. In 1996, the percentage of soybean acres row-cultivated dropped to less than half (48 percent). At the same time, herbicide costs per acre increased by over two-thirds.

I asked some farmers who work with me why they thought that trend was occurring. Everyone mentioned time, in addition to the obvious move toward drilled soybean or narrow row systems. One commented that he had a late model cultivator with an electronic guidance system that was available if he ever needed or wanted to cultivate. The issue was he never wanted to cultivate. In 1997, he cultivated only 25 of his over 2000 acres of corn and soybeans. He said he knew his herbicide costs were high but his time was worth more than the difference. He is an established farmer, and his analysis would be different if he was just starting out or farming part-time.

Another research area leading to more management-intensive systems is the work in grazing options. This work can be categorized as intensive or rotational but is intended to identify and evaluate strategies. The idea is to make optimal use of pasture resources. Advances in fencing allow quicker, more convenient separation of pastures. Animals are given just a few days in one pasture area and then moved to a new area with fresh grass. I have seen how after just a few days the animals know when they are going to be moved and why. Herding is much easier and the profitability has been demonstrated.

The two areas mentioned in weed and pasture management are just a part of the efforts to integrate all of the decisions. Integrated crop management and integrated farm management are general terms given to this work of trying to identify options. Soil testing, nitrogen management, seed selection, and so forth are all a part of the identification and evaluation of alternatives.

A final example of small farm options is the work linking conservation activities on the land and in the production process with environmental outcomes more favorable than the current ones. Regardless of the specific area, there are many more examples of work with potential for small farms.

Recommendations to the Commission

Although risking going over my time, I would still like to briefly present my recommendations to the commission.

All USDA-funded studies should be evaluated for their impact on size. Different technologies benefit different sizes of farms. In the recent Rural Life Poll in Iowa, farmers were asked who they thought would benefit from 10 new technologies. On the average only 2 percent felt small farms would benefit, 7 percent said medium-sized farms, 28 percent large farms, 31 percent all farms, 21 percent said agribusiness, and 11 percent said consumers. If we are truly interested in small farms, then we should be pursuing technologies and systems to benefit them.

We need to keep the distinction between public and private research clearly in mind. I have given a paper on this and it is one of the important dichotomies to remember. Private research is for private gain. Companies are in business to make money. They should exhibit a social conscience and as consumers we should support them, but in the final analysis a company has to make money to stay in business. Public institutions and organizations should have complementary but different objectives. A paper by Wally Huffman and Richard Just made the distinction that private research should be in the topic areas to make money while public research should be in the areas of pre-technology, social issues, food safety, environmental quality and so forth.

We must continue to examine a whole array of options. Every farm is unique and the more options that are available, the greater the chance for choosing successful ones. The options must be structured to build on the strengths of small farms. At the very least the work should be size-neutral.

It is important to not confuse wanting to feed the world with wanting the world to be fed. Many people talk about the need to feed the world but I submit that the ones in the world who need to be fed cannot pay for what we have to offer. We are seeking exports to help with the balance of payments and to make money, but that is different than the egalitarian notion of wanting the world to be fed. Problems of hunger and poverty are complex and beyond the current discussion but the argument that we need to continue along the path that is getting rid of farmers so that the world can be fed is without merit.

We need to keep in mind that agricultural policy covers more than production. How a society feeds itself and utilizes its natural resources determines how long it will survive. Agriculture involves both the production and the culture. Environmental quality, quality of life in rural communities, and quality of food are just part of the concerns for agricultural policy makers.

There needs to be better information on the extent and nature of family farms in agricultural production. But it is more important to get better information on the extent, nature, and consequences of the concentration all along the food chain from the field to the table.

Finally, I think it is very important not to merely start a new program for small farms. Size considerations and social responsibility needs to be built into all USDA programs.

Conclusion

The trend toward larger farms and the trend toward a more capital-intensive production system are different perspectives on the same phenomena. As we have progressed as a nation we have stressed increasing specialization, size, growth, and so forth in all businesses. We are disappointed if the business or economy does not grow. But how are we growing and what are we growing into?

The trend is not inevitable, but change is. The questions we choose to ask and the research we choose to fund all determine the direction in which we will go. It is a question of our approach and attitude. Are we going to continue to view nature as the enemy to be conquered or are we going to start viewing ourselves as coinhabitants?

Society has to decide on the goals and objectives for agricultural policies. Simply making the most money in the short run or having the cheapest out-of-pocket food possible are goals that can lead to trouble.

Small farms can compete but not if they try to act like big farms. They must rely on finesse, not on volume. Research needs to be directed at evaluating and identifying options concentrating on the small farm strengths. We need to conduct research in the direction we want to be heading.

Thank you for your time and attention.

A FARMER LOOKS AT RISK MANAGEMENT

by

The Honorable David A. Swinford
State Representative
Texas House of Representatives

Farmers make professional gamblers look like wimps. Can you imagine putting your entire worth, your home and all your dreams into an agricultural product - a product that depends on the weather, insect control, weed control, foreign markets, world politics, rumors of the President's love life, Oprah and Saddam Hussein? This is the sort of risk that they take and yet tell you they won't gamble on the "futures market." You know in fact that not protecting production costs or production of a crop is really the gamble.

Being a producer that markets the crops from my farm as well as being the marketing manager for a large grain co-op, gives me a rather unique view of risk management. Representing my district in the Texas Legislature and serving as the Vice-President of our Agriculture and Livestock Committee really brings a multitude of agriculture decisions before my desk.

To fully understand my perspective on this subject, let me first describe my area of Texas. I live in the panhandle of Texas - north of Amarillo. This area is one of the most productive in the world. We depend on irrigation which turns a desert into an agricultural paradise. Our small area produces 44% of the wheat, 33% of the corn, 27% of the milo, 100% of the sugarbeets, 76% of the fed beef, and 11% of the hogs in the state of Texas. In addition, the area has enough oil and gas to make it one of the dynamic economic areas in the U.S. Because we depend so much on irrigation, we depend much less on mother nature. We use water where and when we need it. My point being that irrigation is a type of risk management - production risk management.

Another facet of production risk management is the use of crop revenue insurance coverage or hail insurance. We of course suggest this insurance along with the latest in production technology, pest management and cultural practices to maximize yield. Nothing will replace yield. The flip-side of production risk management is price risk management which is also the hard part for our farmers. I joke and tell them they always use the three step approach - hope, greed and then fear. Hope is always present at planting time regardless of price. When mother nature puts her world in bloom, how can you doubt that this will be the crop to end all crops? The farmer has both production hope and price hope. Hope usually lingers until the price starts up, and then greed sets in. The thinking is that the price has to go up - it did last year, right? Sure enough, planting scares, floods, drought, and uncertain crop size usually make the futures price jump some time during the crop year. Are we ready to capture this opportunity? Heck no! They will have to pry this corn out of my dead hands! No one will get *my* corn for less than \$5.00/bushel. Greed is set in concrete. Farmers tend not to sell on an up market. If the market

starts down, he waits. He's not going to let them steal his corn. Then the price keeps going down, down, down. His banker tells him to sell, his wife threatens him with divorce, his doctor tells him he will die from stress, and finally, fear causes him to sell. This scenario happens to the farmer or livestock producer each year if he does not develop a risk management marketing plan.

What kind of plan should be used? I recommend the following:

1. Determine the cost of production. If the cost is not known, you might sell too cheap.
2. Determine your five year yield on each farm. Take 80% of that yield and calculate the maximum contractable bushels.
3. Draw a grain bin on a piece of paper and divide the bin with lines at each one-third level.
4. Market the bottom one-third of the bin at any time you can get your cost of production plus a reasonable profit. (By "market" I mean forward contract to your local elevator or processor. Leave the price risk up to them.)
5. Move to the next one-third of your grain bin. This one-third should be hedged (selling of futures) instead of actual grain when prices reach a desired level. In effect, this will lock in a price for later delivery when the actual cash grain is delivered and sold so that the futures would be purchased.
6. The final one-third of your grain can be hedged by buying puts (a right but no obligation to buy futures) at a profitable level. This provides a minimum price but allows for the price to go up. You sell your grain and yet benefit if the price goes up. Delivery is not required in case of failed production.

If you have an average crop, this will allow 20% not previously sold to move into the market at anytime it becomes profitable and complete your sales.

The most important aspect of any marketing plan is having it written down and execute it without second-guessing yourself. If needed, instructions to market your grain at specific values can be left with your broker or buyer so you can go about farming.

Risk management sounds so simple yet many find it very difficult to give up that human element that follows the hope, greed then fear theory embedded in our souls. I can tell you today that I have two-thirds of my corn and wheat crops priced at a profitable level, and I am two months away from planting corn. I maintain that there is greater leverage in *selling* then growing the crop than growing the crop and waiting to see what people will give for the crop.

RISK ASSESSMENT PROVISIONS OF IMPORT AND EXPORT REGULATIONS

Alwynelle (Nell) S. Ahl

Director, USDA Office of Risk Assessment and Cost-Benefit Analysis

Risk Assessment for Biological Agents

Risk assessments for human health or environmental health have been carried out by the Environmental Protection Agency (EPA) and Food and Drug Administration (FDA) for a number of years. Historically, most of the hazards were chemicals or toxins; the risk assessment methods for these agents have been investigated for thirty years. However, many of the hazards of interest in agricultural imports are different: they are caused by biological agents which can replicate. Thus a commodity with no detectable level of a biological agent (bacterium, fungus, or virus) could enter an importing country, reproduce itself, establish and spread. In contrast, for chemicals and toxins, the "dose makes the poison." Risk assessment for these agents is focussed on understanding exposure and dose-response assessment for humans and the environment. For chemicals and toxins, the original amount of material deposited is known. However, once a reproducing hazard enters the importing country, it may be impossible to contain. Therefore the primary focus of import commodity risk assessment is to avoid bringing an unwanted agent into the importing country: prevention is foremost.

The development of the concept for the General Agreement on Tariff and Trade (GATT) in the 1980s provided the stimulus to use science-based risk assessment as one tool for evaluating the acceptability of an import. At that time, a specific sub-discipline for biological agent risk assessment did not exist. In the early 1990s work was begun in several countries to develop approaches and methods for biological agent risk assessment. USDA's Animal and Plant Health Inspection Service (APHIS) in 1989 began to evaluate concepts to support risk assessment for support of sanitary and phytosanitary (SPS) decision-making. Since that time, variety of methods, both qualitative and quantitative have been developed. The ways in which these methods may be most usefully employed in decision-making is a topic of current discussion in the fields of crop, livestock and human health (food safety).

Science and Risk Assessment

There is much confusion about the nature and uses of science and of risk assessment. Science proceeds by establishing an hypothesis and trying to discredit it. Following numerous tests of the hypothesis, if it cannot be disproved, it is accepted as part of the factual body of science. Basically science is a very conservative and time-consuming process which demands high level of proof to establish a fact. The goal is to advance our understanding about phenomena in nature.

Risk assessment is not science. Risk assessment structures the best available scientific and other relevant information to make decisions about hazards. Hazards are things that can go wrong. For example, how likely is the dam to break? Or if I invest money in a particular stock, how likely will I achieve a net financial gain. As a formal discipline, risk assessment has been applied in fields such as engineering, finance, and insurance for many years. The General Agreement on Tariffs and Trade (GATT), now the World Trade Organization (WTO) and other treaties, from the late 1980s to early 1990s, require that science-based risk assessments be used to establish appropriate sanitary and phytosanitary protection (S.P.S.) for an importing country. World trade restrictions must be based on the findings of risk assessment, not the politics of the past.

Risk assessment as a formal academic discipline is young enough that the definition of terms in the field are not standardized. To complicate matters, risk studies took words from the vernacular and endowed them with special significance. The lack of unanimity about the meaning of the terms adds another layer of complexity in mutual understand. In 1991, a basic set of terminologies were established for agricultural use to avoid unnecessary differences about items on which there is actual agreement. **Risk analysis** is the term used to encompass risk assessment, risk management and risk communication. **Risk assessment** is the term used to define the analytical approaches, processes, models, methods and calculations. Risk assessment answers three basic questions about hazard and risk. The question for **hazard identification** is what can go wrong. **Risk** is answered by two questions: (1) how likely is it that the hazard will occur and (2) what is the magnitude of the consequences if the hazard does occur. This latter question may be answered in biological or economic terms. **Risk management** is the decision making activity in which results of the risk assessment are incorporated. It is important, however, to understand that the results of the risk assessment is only one element which must enter the thinking of the risk manager. **Risk communication** is the open communication between and among all interested parties, especially the individuals and groups most affected by the decisions.

Risk Assessment and Decision-making

Risk assessment as a discipline formalizes some of the most successful strategies used in decision-making. For example, one performs an informal, intuitive risk assessment at each crossing of a busy street. In planning to arrive on time for a meeting in a distant location, the same informal and intuitive processes are at work. In fact, agricultural producers or farmers are among the most successful risk assessors. The market dictates that those who are not become “former farmers.”

Decision making in government for protection of human health, safety or the environment (including the protection of crop and livestock resources) in the past has been based on knowledge and science, but the risk assessment has largely been informal and intuitive. With the advent of WTO and NAFTA, these methods are no longer acceptable. Instead, risk assessments must be documented in writing, transparent to understanding, well-organized for clarity, flexible to take into account new information, and consistently applied.

International standard setting organizations (e.g., Codex Alimentarius, International Plant Protection Commission, and Office of International Epizootics) are currently discussing standards, methods, procedures for evaluating biological risks associated with trade. This includes attempting to define what is an acceptable level of risk (ALR) and an appropriate level of protection (ALP). The WTO requires that the ALP be based on "...available scientific evidence, relevant processes and production methods, relevant inspection, sampling and testing, relevant ecological or environmental conditions..." If insufficient scientific information is available to make a decision, the importing country must "...seek additional information for more objective assessment of risk...in a reasonable period of time..." The ALP should minimize negative trade effects.

The ALP standard may include relevant economic factors. For example, the lost production and sales of a commodity in a country in the event of entry of the hazard (biological agent). The costs associated with containing the establishment and spread of the pest or disease agent may be considered, as well as costs of control and eradication should that be necessary. The cost-effectiveness of alternative mitigation measures is especially recommended because that assures that the risk is controlled in the least expensive way, an advantage to both the economy of exporting and importing countries.

Current Activities in Risk Assessment for Agricultural Trade

Current work in risk assessment focusses on methods for risk assessment (more research is needed in this area). There must be scientists trained to perform risk assessments. Decision-makers must continue working to understand the meaning and implications of risk assessments. And all must work toward the goal of international harmonization.

Risk assessment based on the best available science along with tools from economics and other disciplines offers the best opportunity for harmonizing world trade guidelines for reducing and preventing risks, and maximize benefits to all.

AGRICULTURAL RISK MANAGEMENT AND THE ROLE OF THE PRIVATE SECTOR

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With passage of the 1996 Farm Bill, one often hears people talk about the sea change that has occurred in agriculture, the declining role of the Federal Govt, and the increased risks faced by agricultural producers. Even those who believe that the 1996 Farm bill represents a more gradual evolution of farm policy changes that began with the 1985 farm bill, acknowledge the need for increased risk management and the potential role for the private sector in meeting these needs.

Federal agricultural risk management programs have becoming increasingly more costly, and account for a larger share of total agricultural program spending. Over the next 5 years the Federal crop insurance program will become one of the largest components of agricultural spending (and by far the most variable). In 1990, crop insurance outlays were less than a tenth the size of deficiency payments. By 2002, they are estimated to total \$1.8 billion, compared to \$4 billion for production flexibility contracts.

The role of the private sector has increased as well. Volume on agriculture futures and options contracts has generally been up over the last few years. New futures and options contracts have been introduced on a variety of commodities including fluid milk and regional corn yields. Elevators and other grain merchants are offering exchange-based instruments tailored to better meet the marketing needs of their clients. On the poultry and livestock side, there has been significant growth in production and marketing contracting.

With this has come questions as to what is the appropriate Federal role. Should the government be developing and subsidizing products that may compete with privately offered instruments? Should the government provide a catastrophic safety net for the sector? Do government regulations offer producers sufficient protection, or are they overly restrictive and thus prevent private markets from developing financial instruments to meet their risk management needs?

Arguments for Government Involvement in Agricultural Risk Markets

The argument for Federal involvement stems from what economists often term A market failure. @ Because of one reason or another, the market fails to provide a good or service. In agriculture, the most commonly cited reasons for market failures are the asymmetric distribution of knowledge about the risk and the highly correlated nature of agricultural risks. Under the former problem, the person who buys the insurance knows more about their risk than the person who is

selling it. This can lead to adverse selection. The highly correlated nature of the risks makes it difficult for an insurer to spread their risks geographically (e.g., Midwest drought).

But even these reasons for government involvement are not ironclad. Adverse selection problems are not unique to crop insurance, yet other lines of insurance are offered without direct Federal involvement. While agricultural risks may be highly systemic in nature, the capacity in world commercial reinsurance markets is sufficiently large to at least theoretically absorb North American crop insurance losses, in part, because they are presumably uncorrelated with other insurance lines.

It is important to distinguish between the role of the Federal government in providing risk transfer mechanisms and that of providing income enhancement. While agricultural programs are often touted for their stabilizing role, the fact is that they have oftentimes provided significant transfers to producers from taxpayers or consumers or both. Private markets can do little to raise average farm income.

Futures and Options

Organized trading in agricultural futures dates back to the 1870s in this country. Despite years of writings about the benefits of futures trading by economists and extension agents, use of futures and options has been limited. Comprehensive survey data is not readily available, but most studies suggest that between 10-15 percent or so of corn, wheat and soybean producers use futures and options.

Why is this the case? One reason is that in the past producers have had agricultural programs like nonrecourse loans to fall back on. As loan rates came down below market clearing levels in the late 1980s, volume on the exchanges picked up. Average daily volume of agricultural contracts traded on the CBOT for 1996-97 was 250,000--a 70 percent increase over average trading levels in 1991 and 1992. Again, we don't know how much of this is due to increased direct use of futures and options by producers. However, greater planting flexibility (witness soybeans), elimination of acreage reduction programs, and increased exports due in part to NAFTA and the Uruguay Round have certainly stimulated volume.

The second reason is that a large volume of production is hedge indirectly through cash forward sales at the local elevator. The Economic Research Service estimates that in 1993, almost 25 percent of corn producers and 30 percent of cotton producers produced their crop under some type of marketing contract. In recent years we have seen the development of exchange-based cash instruments like flex options, basis contracts, hedge-to-arrive contracts--all designed to give producers more flexibility in marketing decisions.

There has been a much interest in the next generation of cash contracts--for example, revenue-based contracts based on county crop yields and December corn futures. Under the current ban on trading of so-called agricultural trade options, such developments are limited, but many hope

to see the Commodity Futures Trading Commission allow a much more open trading environment.

Crop and Revenue Insurance

Crop insurance participation has increased dramatically since the 1988 drought when only 25 percent of eligible area was enrolled. Currently almost two-thirds of eligible area is enrolled. Some of the increase is due to the linkage requirement of the 1994 Crop Insurance Reform Act that mandates sign up for catastrophic (50 percent yield) coverage if a producer receives other commodity program benefits such as production flexibility contract payments, but significantly, participation in so-called Abuy up@ coverage is up as well.

There has also been significant growth in development of revenue products. Crop Revenue Coverage (CRC) was introduced two years ago on a pilot basis for corn and soybean producers in Nebraska and Iowa. It is currently offered in most areas of the country where soybeans, wheat and corn are grown and is also available for cotton and sorghum. Two other revenue products--Income Protection and Revenue Assurance--are available on a regional basis and more products are currently being considered.

Significantly, many of these products have been and are being developed by the private sector. The revenue products receive approximately the same level of subsidies as Federal multiple peril crop insurance (MPCI) policies. In addition, private companies offer a range of unsubsidized insurance products, including crop hail policies, and add-ons to MPCI such as replacement value coverage and additional yield guarantees that allow producers to insure their crops at higher than the maximum 75 percent coverage level offered under the MPCI policy.

Most insurance policies cover crop but not livestock risks. While producers may be able to get insurance to protect their cattle from getting hit by lightning, it is more difficult to find insurance that will protect them against a disease outbreak that could potentially devastate a herd. There has been interest on the part of insurance companies in developing business interruption insurance for companies; however, the size of the risks and the potential for moral hazard have likely prevented such policies to be developed at an affordable price.

But livestock could be potentially covered under whole farm insurance. Under this type of policy, a producer would receive an indemnity payment when total farm revenue fell below a revenue guarantee. A whole farm insurance proposal is currently under consideration by the Federal government with private sector development.

There is also considerable interest in the development of individual savings accounts for producers similar to the Net Income Stabilization Account (NISA) in Canada. Under NISA, producers can place up to 20 percent of their eligible sales into a savings account. Contributions up to 3 percent of eligible sales are matched dollar-for-dollar by the government. Accounts may be maintained at local banks with the government providing a three percent interest subsidy on the producer contribution. The farmer=s contribution is taxed in the year it is deposited;

government contributions are taxed only in the year in the year withdrawals are made. Withdrawals from the account are allowed only when net income (sales minus expenses) falls below a five-year average or below a minimum income level. Balances can be withdrawn at retirement.

What Is the Proper Federal Role?

Should the Federal government be in the business of "retailing" risk management products (e.g., product development, rate setting, sales)? With the 1996 Farm bill, there is far less direct intervention by the government in agricultural markets. Nonetheless, USDA continues to have a large role in the development of risk management products. For example, the Risk Management Agency continues to set crop insurance rates for Multiple Peril Crop Insurance products. But many have argued that this a role that the private sector could be better suited to perform. As discussed above, over the past three years, we have seen the private sector development of revenue based contracts. Recent legislative proposals would give the private insurance companies a more direct role in establishing premium rates.

Others have argued that the Federal government should be primarily concerned with a role at the "wholesale" level as catastrophic reinsurer. USDA currently provides catastrophic protection to crop insurance companies through its reinsurance treaty. There is a large commercial market for reinsurance and that there has been interest expressed by some insurance companies to take on more risk in exchange for the possibility of higher returns. However, there are large areas of the countries where the returns are too variable and the chances of catastrophic losses too large to think that the private sector would ever be willing to offer protection without charging very high premiums. Arguably a public role for govt to continue to provide protection.

Lastly, there is a question of subsidies. For example, in the crop insurance program, the government provides subsidies to producers to offset the costs of the premium, subsidies that reimburse crop insurers for delivery of the product, and subsidized underwriting gains through the reinsurance agreement. Critics have pointed out that this gives crop insurers an unfair advantage over other merchants of risk management products (e.g., elevator operators). The size of the subsidies will likely come under increasing scrutiny as crop insurance costs become larger relative to other programs.

CONCLUSIONS

The 1996 Farm bill has provided a strong impetus for innovation in agricultural risk management instruments by the private sector. While this is a trend that started long before passage of the 1996 farm bill, the reduction of the price-based safety net for producers will likely create a further demand for such instruments. Debate on what the proper role for government is part of the groundwork that will be taken up by the Commission on 21st Century Agriculture.

The private sector has long provided risk management instruments and is well suited to tailor products to suit the needs of producers. I believe that it is important for the government not to crowd out innovation, but rather work with the private sector to provide producers and others in the agricultural industry prudent means to manage risks.

Linking Science and Education To Enhance Understanding of Risk

Eileen Kennedy

Acting Deputy Under Secretary for Research, Education, and Economics
U.S. Department of Agriculture

Today we have embarked on an attempt to "**Survey Agriculture's New Frontiers**" at Outlook '98. We are looking at issues involving food safety and marketing, as well as the impacts of biotechnology, infrastructure changes, international trade, and the economics and finance of small farms and rural businesses. All of these issues have one thing in common for American agriculture. They are all in a state of change and that change represents some level of RISK to the economic well being and survival of the individual farm, ranch or agribusiness.

If we define risk in a very broad sense, we might think of it in terms of exposure to the probability of an adverse effect that can happen in the future as evidenced in the variability of (data series) over time. In an economic sense, risk is uncertainty that "matters" and involves the probability of losing (or making) money. It may manifest itself in the form of adverse effects on human health, the lack of adequate credit or legal actions that threaten a business. We know, for instance, that price and yield vary significantly over time and we have devoted much effort over the years to mitigating the effects of the factors that cause those variations. The passage of new Policy Legislation, the collapse of the Asian Economies, or the occurrence of a 100 year storm are **events** that create their own set of "risks" and we must attempt to help the growers understand and deal with them. To complicate matters, most of these risk factors don't fit neatly into some little box; rarely do we have a change in one arena that doesn't affect a multitude of others.

Public Policy Issues:

Issues such as environmental regulations, trade policies and other governmental programs are all areas where the perception of the public is a driving force that determines how we ultimately conduct business. In rural areas, we find that there is a great deal of stress resulting from risks due to changes in technology, global exposure at the local level, and the overall "industrialization" of agriculture. These events represent both challenges and opportunities. Never forget that profits are returns to taking risks. We must be vigilant and creative in both the public and private sectors to take full advantage of these occurrences.

Technology

You will have opportunities at this conference to hear discussions of bio-tech innovations and issues, future bio-engineered commodities, and the future of insect resistant crops. When you couple these discussions with the question of "who will control these innovations" therein lies a tremendous area of risk and uncertainty for the supplier, producer, and processor. How near is the day when the grower will have diminished markets for his crops or livestock if they are not "bio-engineered?" What are the implications for capturing new efficiencies and are there environmental risks or benefits associated with the new products? New

risk management tools are coming on line to assist producers, although much remains to be done. The Economic Research Service (ERS) has completed 45 reports examining the feasibility of insuring crops not currently insured through the Crop Insurance program. The ERS is also investigating market-based methods for limiting farm risks, including yield futures contracts and other tools.

International Trade:

Almost without exception, the concurrent sessions of this conference having to do with commodities, are heavily weighted with a "global" perspective. Pick any page of your program and you will find titles such as the "Trends in Asian Cotton Trade" and "Coping with Sanitary and Phytosanitary Trade Barriers." We are facing risks that have different dimensions or were not even present a few years ago. Reduced trade barriers provide new opportunities abroad and create new challenges at home.

Changing Infrastructure:

The evolution occurring in agriculture's infrastructure is perhaps the greatest area of uncertainty, with the largest number of tentacles reaching into other areas of the food and fiber sector. Concentration within sectors is being propelled by changes in technology and genetics, and firms are racing to stake out their claims to various segments of agricultural production. Round-up ready soybeans, high oil corn, and satellite crop scouting for disease and insects are examples which are just the tip of the iceberg. Farmland Industries, the largest farmer owned cooperative in the country, will not buy hogs or cattle from their members if they are not from "approved" genetic lines. Integration of the poultry, and now the swine industries have shown the way that could eventually lead to "systems" that will furnish inputs, management, and financing to growers. Contracting between the producer and the processor may become an important area where risks and risk-sharing must be recognized. All these developments may alter the role of local firms and lead to the decline of some rural outlets that supply today's agriculture.

Where Do We Go From Here? The Role of Science and Education

Our Historical Base

If I have painted a bleak picture of risk today, I really didn't intend to. We have much experience and prior work to use from our strong history of risk management research and education. The Land Grant University System, partnering with the Cooperative Research, Education and Extension System has addressed economics of risk management in the past. In the 1970's and 80's Ikerd, Anderson, and Nelson along with Baldwin, Wisner, and Good placed emphasis on risk management in both production and marketing. Today, when the issues are more complex and the challenges greater than ever, the CSREES and its Land Grant University partners are emphasizing this important area. Fundamental work is underway to develop and improve statistical techniques that will use the growing body of data to more accurately capture decision making processes. Applied research and outreach on whole-farm risk management models are being conducted by Irwin, Miranda, Williams, Dismukes and others in research efforts designed to capture the multi-dimensional aspects of risk management.

Current Efforts

The understanding and management of risk in agriculture is currently being addressed, as directed by the Federal Agricultural Improvement and Reform Act of 1996. Section 192 of this statute gave a mandate to the Secretary of Agriculture to, "....provide such education in management of financial risks inherent in the production and marketing of agricultural commodities." In April of 1997 the Secretary solidified the educational effort in risk management in a decision memorandum that created the "USDA's Risk Management Education Steering Committee whose members are the Administrators of the Cooperative State Research, Education, and Extension Service (CSREES), and the Risk Management Agency (RMA) and a Commissioner from the Commodity Futures Trading Commission. This Steering Committee is guiding an expanded program in risk management education, with private sector participation, that will assist the agricultural community in dealing with the new risk environment. A Request for Proposals (RFP) to address areas where there are "gaps" in our body of knowledge (research), educational content (curricula), and delivery vehicles has recently been announced.. In addition, a "pre-session" will be held at the American Agricultural Economics Association (AAEA) meetings in Salt Lake this summer to address pressing producer and agribusiness needs for risk management research and education.

Risk Management Strategies

Additional research and education is preparing producers and agribusinesses to think strategically as a method of managing day-to-day risks and adapting to shocks caused by unexpected weather or global market events. Research at Land Grant Universities is developing new models and decision aids that will assist rural businesses cope with the combined set of risks that they now face. Interdisciplinary programs in the production, marketing and financial areas are focusing attention on the interrelationships among the various risk areas.

New approaches and strategies are being identified. The ERS is conducting analyses that use a whole-farm approach to improve understanding of how farm households may self-insure. These may include diversifying activities, working off farm, and making adjustments in savings and borrowing. These approaches, and others, are relevant for small and limited resource farm families as well as for other farm and rural businesses across the size spectrum.

The Challenge Ahead

Much of what I've covered relates to public sector activities. Now, in an era of increasing complexity and growing demands for risk management science and education, we must think of new models and partners for our science and education programs. To achieve maximum understanding with available resources, our efforts in agricultural risk management must link public sector science and education to the many opportunities that exist to further understanding through contacts within the private sector. So called "delivery points" exist in multiples within the private sector as farmers and agribusiness operators interact around production, marketing and financial considerations. I would encourage each of you to become involved in this very exciting time for research and extension education in risk management.. Risk management by participants in the American agricultural sector as we approach the 21st century contains much "new ground" where linking science and education can make significant contributions.

**Talking Points for August Schumacher
Under Secretary for Farm and Foreign Agricultural Services
U.S. Department of Agriculture**

Good afternoon. I'm glad to see that you have stayed with us after the afternoon break, and are ready for more. For those of you who are joining us for the first time this afternoon, I welcome you.

I'm Gus Schumacher, Under Secretary of USDA's Farm and Foreign Agricultural Services. I'm pleased to be your moderator for this panel on sanitary and phytosanitary trade barriers.

First, let me explain how we will proceed. I will introduce each panelist. Following all three presentations, I will open the floor to questions. I look forward to some challenging questions so we can generate a stimulating and informative discussion.

But before I begin the introductions, I would like to briefly review some of the current sanitary and phytosanitary (SPS) trade issues facing the United States.

First, let me start by saying that by all measurable accounts, U.S. agricultural trade policy has helped put our food and agricultural sector on the road to success. Trade reform agreements such as the Uruguay Round Agreement on Agriculture and the North American Free Trade Agreement (NAFTA) are landmark accomplishments that have laid the groundwork for long-term growth in U.S. agricultural trade. These efforts have helped American farmers by freeing them from flagrant trade barriers.

We produce fine quality products that are designed to appeal to a wide variety of tastes around the world. Part of our success can be attributed to the fact that we have been able to expand our market share. We are now the world's leading exporter and the most improved competitor. As you heard this morning, we expect this year's exports to reach \$56 billion. That will make 1998 the fourth consecutive year with U.S. exports over \$50 billion.

While significant progress has been made in some key areas including reductions in tariffs and export subsidies, we still face many difficult sanitary and phytosanitary issues that need to be resolved. The commitments that signatories to the World Trade Organization's SPS Agreement made three years ago will be instrumental in moving many of these issues to resolution.

That is why we took the EU hormones policy to the World Trade Organization for consideration and resolution. Last month, the WTO Appellate Body, in its review of the August

1997 Panel decision, firmly upheld the initial WTO Panel decision, saying that the EU ban is inconsistent with the SPS Agreement. This latest report clearly affirms the earlier Panel's finding that the EU ban was imposed and maintained without credible scientific evidence. As a result, the WTO Appellate Body called for the EU to bring its measure into conformity with its WTO obligations. In this case, we expect the EU to fulfill their international obligation by removing its beef import ban.

We are working to resolve U.S. concerns over Japan's restrictions on imports of U.S. apples and other fruits, for which Japan is requiring variety-by-variety testing on the efficacy of quarantine treatment for pests. We have begun formal dispute settlement proceedings with Japan on this issue. While formal dispute settlement under the Sanitary and Phytosanitary agreement provides a significant avenue for redress of SPS issues, many more issues are being resolved bilaterally. For example, after years of negotiation, Japan opened its market to U.S. tomatoes in 1997. (We'll be hearing more about that market-opening achievement later in this panel discussion.) The potential value of the Japanese tomato market may be as high as \$20 million annually.

Future Trade Issues

The reforms begun in the Uruguay Round need to continue. To this end, we hope to achieve substantial additional reductions in tariffs on agricultural products; the elimination of export subsidies; further cuts in trade distorting domestic subsidies; new disciplines on the operations of State Trading Enterprises; and tighter rules on sanitary and phytosanitary measures that restrict trade---the last facade which governments hide behind when they want to protect their agricultural industries from foreign competition.

We have placed special emphasis on monitoring and aggressively challenging other countries' use of non-scientifically based SPS standards that unfairly restrict U.S. access to foreign markets. USDA has devoted significant resources toward identifying these potential barriers to agricultural trade and putting in place an interagency process to track our progress on resolving these barriers. We know from estimates and experience that over \$5 billion in U.S. agricultural exports, or slightly less than 10 percent of our agricultural exports, have either been lost or could potentially be lost if foreign governments enforce regulations that are either on the books or under consideration.

We also want to make sure that science, not politics, is the guide when countries adopt measures relating to health and safety. Belief in the scientific method also must be the foundation of informed public policy. A policy based on public perception, rather than fact, will ultimately fail. Our goal within the WTO is to work to build public confidence in the international standard setting process, so that food safety and environmental quality will not be jeopardized in our efforts to facilitate trade.

WTO members in the international community must set international plant, animal and human health standards that reflect the best scientific information we have available to assess risks and determine the most appropriate measure for addressing these risks. More transparency is critical and broader participation is vital. We are looking forward to working with our trading

partners to meet these goals.

But now, I am happy to introduce our panelists.

Introduce First Speaker:

Our first speaker, Paul Drazek, is well known to many of you here today. Mr. Drazek is Secretary Glickman's special assistant for international affairs. He has 25 years experience in the field of international trade and has extensive knowledge of domestic and international trade rules and practices.

Mr. Drazek is certainly no stranger to USDA. He began his career with the Foreign Agricultural Service, serving 14 years as a trade policy and marketing specialist. During his FAS career, he served as agricultural negotiator on the U.S. delegation to the Tokyo Round of multilateral trade negotiations in Geneva, Switzerland, and as Agricultural Attache in Mexico City.

Before Paul was appointed as Special Assistant to the Secretary, he was Director of Governmental Relations for the American Farm Bureau Federation, specializing in international affairs and legislative issues affecting U.S. agricultural trade.

Today, he will discuss ongoing efforts to combat sanitary and phytosanitary barriers to U.S. exports. I'm pleased to introduce to you Paul Drazek.

Introduce Second Speaker:

Our next speaker is Ed Beckman, President of the California Tomato Commission. The Commission represents all growers and shippers of fresh tomatoes in California. In 1997, California produced over 1 billion pounds of tomatoes, and exported a record 12 percent of the total crop to Canada, Mexico, Hong Kong, and Japan.

Mr. Beckman began working with the California Tomato Commission as the Marketing Director and was appointed President in 1989.

A native of Fresno, California, Ed is working on his Masters in Management and Organizational Leadership from Fresno Pacific University. He has also taken marketing classes at the University of California, Berkeley, and the Wharton School of Business.

In addition to his duties as President of the California Tomato Commission, Ed is currently Chairman of the United Fresh Fruit and Vegetable Association's Tomato Division, and serves on the Executive Committee of the California Commodity Committee.

Over the past few years, I have come to know Ed as a friend and a visionary leader for U.S. agriculture. Nine years ago, the California Tomato Commission began its efforts to open the Japanese market to California tomatoes. His dedication and hard work on behalf of the Commission paid off in 1997 when Japan opened its market for 25 varieties of U.S. tomatoes--a market that is estimated at more than \$20 million. Today, Mr. Beckman will talk about his

market experience with Japan and the kind of barriers U.S. exporters face. Ed, I am very pleased that you could be with us today.

Introduce Third Speaker:

Our final speaker is Charles Riemenschneider, Director of the North American Liaison Office of the Food and Agriculture Organization of the United Nations (FAO). Chuck and I have known each other for years--back to the days when we both worked for the World Bank.

Chuck was appointed Director of FAO in 1994, and since that time, he has been coordinating the Organization's activities for the North American Region. As Director, Chuck represents FAO before the governments of the United States and Canada, and North American international institutions such as the World Bank, the Inter-American Development Bank, and nongovernmental organizations in the region.

Mr. Riemenschneider holds an M.S. and Ph. D. in Agricultural Economics from Michigan State University and a B.S. in Agricultural Economics from Rutgers University. He has served on the faculty of Michigan State University, and as a consultant to the USDA, the World Bank and to domestic and international companies in the farm input supply, agricultural marketing, and food processing industries.

In the early 1980's, Mr. Riemenschneider served as a Vice President and Senior Agricultural Economist at Chemical Bank in New York City. He was also Majority Staff Director of the U.S. Senate Committee on Agriculture, Nutrition and Forestry for 8 years.

Today, Mr. Riemenschneider will talk about the changing role of international standards as a result of trade agreements. Chuck, I'm pleased you could be a part of the panel today.

US TOMATOES IN JAPAN: EVOLUTION OF A SUCCESS STORY

Edward Beckman
President
California Tomato Commission

In 1989, a member of the California fresh tomato industry suggested that Japan could be a profitable market for our growers and shippers. In 1997, the first shipments of U.S. fresh tomatoes arrived in Japan. The eight years between the idea first being raised, to the arrival of the first imports, is a study of cooperation, frustration, and a struggle to keep industry focused on the challenges of developing an export market some 7500 miles away.

Since 1951, Japan prohibited the entry of fresh tomatoes because of the disease tobacco blue mold. Japan's position was, although the chance of tomatoes being infested with the disease is exceedingly low, there is no clear authoritative reference that the fungus does not transmit to fruit. Therein lies the problem: A lack of conclusive evidence that would address the concerns of the Japanese government and Japanese tomato and tobacco growers.

Prior to first contacting USDA-APHIS, the Commission enlisted the support of pathologists within the University of California system, and through an exhaustive literature search, found no evidence of tobacco blue mold ever being found on tomatoes; in fact, the only occurrence in California, was in 1885 on wild tobacco. There was significant doubt among the U.C. researchers that the fungus found in San Diego County was actually the "blue mold" in question.

Concurrently, the Commission undertook a market study of Japan, to determine the potential market share for our product. The study, conducted by Harvard Business School, concluded that the market for US tomatoes was the emerging fast food industry.

Looking back, I believe the Harvard and University of California studies were essential to lending credibility to our initial discussion with the USDA. From these initial discussions, we sought a partnership with USDA APHIS and ARS that would bring about a united effort to open Japan to US Tomatoes. It was a partnership that would require a financial investment on our part, and the resources of USDA over an extended period. In short, a relationship between private industry and the Federal government with a common goal: To open Japan's food service market to US tomatoes thus improving the financial position of the US fresh tomato industry.

In 1991, the Commission formally requested through APHIS that ARS undertake research that would address the concerns of the Japanese. The two-year study would cost \$130,000 and would be funded in part by the Commission. This study would seek to clear ten tomato varieties for export to Japan.

The proposed research protocol did not set well with California growers. First, we knew from our own research that tobacco blue mold does not infect tomatoes, and that tobacco blue mold is not found in California. Second, to limit the study to but a few specific varieties would limit our

opportunities for success once the market is open, as varieties change every few years. It was possible that if the market did not open quickly, only a few of the listed varieties would still be in production. There were additional concerns: What of adding additional varieties, would this require another \$130,000 investment? And, because of the historical lengthy discussion on phytosanitary issues between the United States and Japan on other fresh fruits, apples for example, many industry members thought the research would never satisfy the Japanese. Only by reinforcing to industry the market potential, and the high level of support we had witnessed from the USDA, was the Commission convinced to go forward with the initial research investment.

The research was completed in 1994, with the results being summarized and presented to the Japanese in the following year. The results being: Tomatoes are not a host of tobacco blue mold.

However, the lifting of the phytosanitary barrier by Japan did not follow quickly. Two years of discussion followed, characterized by frustration and false hopes. Industry was losing faith. At the same time, the relationship between industry and the USDA, both APHIS and FAS was on very solid footing. There were frequent discussions on the status of talks, the need for additional information to be gathered and presented to MAFF, and importantly, extensive strategy on the issue of "what after the market opens."

In April 1997, the 46-year-old quarantine on US tomatoes to Japan fell.

Once the phytosanitary barrier was lifted, but prior to the first shipments, the Commission worked closely with APHIS on issues related to pesticide use. The Commission has maintained a database on pesticide use, which proved essential to answering the questions of Japan's Health and Welfare Ministry. In addition, we provided residue analysis on 75 million pounds of fruit, again, to reassure the Japanese as to fruit safety, and to minimize the inspection process upon arrival.

And now, as has been said...the rest of the story.

Again, prior to the opening of the Japanese market to US tomatoes, the Commission had conducted extensive meetings with the Japanese trade; our goal was to target US tomatoes to food service, thereby eliminating the speculation buy, where trading companies use volume to secure market share, regardless of demand. Nearly all of the US tomatoes cleared for export are not suited for the Japanese consumer, only to food service, where the tomatoes are sliced or diced, and speculative buys could undo much of the groundwork done by the Commission and the Embassy in Tokyo.

We were successful, as most initial shipments were of test volume, several thousand pounds, not thousands of cartons brought into Japan on speculation. From these test shipments, many of our concerns, regarding the trade perception of our product, were realized.

By far, the most pressing issue from the Japanese trade was: What does tobacco blue mold look like? What if a US tomato has it? While both governments recognized that tobacco blue mold was a non-issue, the trade believed it was a scientifically sound issue, worthy of their concern.

The first commercial use of US tomatoes came about four months after the market opened. The product launch in Japan was by Wendy's, the US hamburger chain with 70 outlets in Tokyo. Their reasoning for purchasing US tomatoes was cost. Their tomato costs declined 40% with US tomatoes, just as the Harvard study predicted. In the first season, California exported 55,000 cartons of fresh tomatoes to Japan, with a FOB value of 425 thousand dollars. Now, six months later, the number of outlets featuring US tomatoes has nearly grown tenfold. By May, over 3,000 outlets of nearly a dozen fast food chains will use US tomatoes. At a box and half per outlet per day that amounts to 1.6 million cartons annually, or about 16 million dollars in FOB sales.

But...the continued growth of US tomatoes in Japan is clearly linked to the resolution of phytosanitary issues.

For example, the first load of US tomatoes from Florida in November was lost, unable to clear customs because of a lack of documentation regarding Caribbean fruit fly. Today, only tomatoes picked and shipped green can be exported from Florida to Japan, even though tomatoes are a poor host to the fly. The alternative, fumigation with methyl bromide is not acceptable, as fumigation will destroy the tomato. An alternative, the 28-day holding period at 32 degrees used in the Florida citrus industry, is also not acceptable, in terms of holding time and temperature, as it would destroy the tomato.

Restricting US exports to Japan to green tomatoes is a threat to our continued market growth. In October and November, a California vine ripe tomato shipper sent 10,000 cartons of ripe tomatoes for sale in Japan through Department stores. Importers say, without twelve-month availability, the growth potential for vine ripe tomatoes in Japan is questionable.

The greatest concern of the Commission, and of the Florida Tomato Committee, our partner in marketing in Japan, is the continued limitation on what varieties may be exported to Japan. As mentioned, the original list of varieties was developed in the early 1990's. Today, of the 26 varieties cleared for export, only four are grown in California. Today, we have tomatoes of much higher quality that are well suited for the Japanese market, and those tomatoes remain in the United States. Further, from additional market research, we estimate a significant market for roma style, plum tomatoes in Japan. For now, because of continued restrictions on the basis of the tobacco blue mold issue, those tomatoes cannot be exported to Japan. And, Japanese growers are introducing new tomatoes, better suited for the local fast food market. If we cannot also introduce new tomatoes, the true market potential for US growers in Japan will never be realized.

Which takes us back to the original conflict within industry on phytosanitary issues: We believe that tobacco blue mold is not an issue. USDA-ARS research confirms our own studies. If we are to grow the Japanese market for US tomatoes, there is a need to clear more tomato varieties for export. Once again, the tomato industry is faced with difficult questions. Will this next effort to lift the remaining varietal restrictions require another eight years and the expenditure of hundreds of thousands of dollars and countless hours of manpower? Unlike the climate that surrounded the decision first made in 1991 by the Commission, there will likely be little debate on the potential of the Japanese market for our growers.

At the Commission, we believe our partnership with USDA, first established in 1990, continues today. Much of our success in Japan today can be linked to the promotional support made

possible through our participation in the Market Access Program. Our partnership must also continue, through APHIS, so to recognize that until the limitations on US tomato exports are lifted, that phytosanitary barriers remain in place, limiting the growth of US tomatoes in the Japanese market.

The responsibility to open a foreign market to a US commodity must be regarded as a partnership. And, I would suggest that much of the responsibility reside with the grower organization, such as the Commission, researching not only the market, but also the phytosanitary issues affecting your commodity. Second, there is the responsibility once the market is open to prevent small problems from becoming major issues.

Today, our in-country representatives use digital cameras to monitor arrivals and upload images to the Internet our tomatoes in Japan. Today, we can view fruit quality just minutes after we record the images. The following case illustrates the importance of such technology: A test shipment to a major fast food chain was being evaluated in Osaka. We were informed that an insect was found in the shipment. The importer demanded of the exporter an explanation and questioned whether they could ever use US tomatoes because of insect contamination in the field. By uploading the image, it was determined the pest was the result of on-site cross contamination, not the fault of the US exporter.

In summary, the Japan project was the Commission's first entry into the issue of phytosanitary barriers. Over the last eight or nine years, we've come to recognize several key issues: The fresh fruit and vegetable industry is fast becoming a global marketplace. With this new opportunity for growth and profit, comes a much higher degree of risk for the grower and shipper. Because of that risk, it is essential that industry have a full understanding of phytosanitary issues from governmental and cultural perspectives; and to use that understanding to establish a partnership with the USDA based upon science and marketing research. Assume a pro-active role on issues that will influence your success. Finally, look to the future. Opening a market can easily take years. While an opportunity may exist today, it's how you will market your crop five, perhaps ten years from today, that will determine whether the investment of the organization, and the support directed to the project by USDA, provides a return on a substantial up-front investment.

SETTING INTERNATIONAL STANDARDS FOR FOOD AND AGRICULTURAL TRADE

Charles H. Riemenschneider
Director, Liaison Office for North America
Food and Agriculture Organization of the United Nations

When the Uruguay Round Agreements of the GATT entered into force in January 1995, a new era dawned in agricultural trade regulation at the international level. Agriculture, for the first time, was brought fully into the multilateral regulatory system for trade. Facilitated by these agreements and a booming world economy, agricultural trade has increased rapidly in recent years raising the stakes for the World Trade Organization—as the successor to GATT—and to other international organizations working in this area.

New demands have certainly been placed on my institution--the Food and Agriculture Organization of the United Nations (FAO). From analysis of the impacts of the previous negotiations to assistance in preparation for the upcoming trade talks in 1999, FAO plays an important information and training role in agricultural trade matters for many developing countries. FAO has a substantive technical assistance program emphasizing capacity building in the developing countries themselves on agricultural and food policy, food safety, sanitary and phytosanitary matters, trade-related intellectual property, and similar matters to help these countries meet their trade potential today and to become more equal partners in future negotiations.

However, our work facilitating international trade is not confined to developing countries alone. FAO has a long history in its scientific role in establishing international standards and recommendations relating to plant health and food safety and quality matters. In particular, the Uruguay Round has raised the profile and brought new status and challenges to all international standard setting bodies in the area of sanitary and phytosanitary regulation where FAO plays an integral part.

In a short speech it is hard to cover all of the relevant aspects of international standard setting for agricultural trade. So I will focus my attention on two specific aspects of the Uruguay Round--the Agreement on the Application of Sanitary and Phytosanitary Measures, or the SPS Agreement for short, and the Agreement on the Technical Barriers to Trade – the TBT Agreement – both have important implications for world agriculture.

I will also focus on two international bodies outside of the WTO—the Codex Alimentarius Commission and the International Plant Protection Convention—which now have a critical role in assuring science-based decision-making under the SPS and TBT Agreements. The work of both of these bodies is undertaken largely within the Food and Agriculture Organization of the United Nations in Rome. I will not address a third key body cited in the SPS Agreement—the International Office of Epizootics which covers animal health and quarantine issues in a manner

similar to the IPPC on the plant side. But this institution plays an equally important role.

Ten years ago it would have been impossible to find more than a handful of people in Washington—outside of USDA and FDA scientists—who even knew what the Codex Alimentarius Commission did. Probably even less knew that the International Plant Protection Convention even existed. Today, the Uruguay Round Agreements have made many producer and industry groups well aware of these bodies and their importance in trade disputes.

The SPS and TBT Agreements

The SPS Agreement has as its primary purpose the protection of human, animal and plant health through the sanitary and phytosanitary measures. The SPS Agreement specifically references the standards, guidelines and other recommendations of Codex Alimentarius and the IPPC as international reference points for food quality and safety and plant health. Nations meeting the level of protection in the Codex and IPPC standards in controlling food safety and plant pest problems are presumed to meet the requirements of the SPS Agreement.

However, the Agreement does not limit a country to the level of safety in the Codex and IPPC standards. Those wishing to impose a higher level of protection than called for in the Codex or IPPC standards must take the least trade-restrictive measures based on sound scientific evidence and internationally acceptable methods of risk analysis.

The TBT Agreement applies to all aspects of food standards not covered in the SPS Agreement. Labeling, packaging and similar regulations would fall under this category. TBT measures must have a legitimate purpose, be proportional to the desired purpose and should be based on international standards. Codex is relevant for the TBT Agreement in areas such as food quality and composition requirements, labeling, nutrition and methods of analysis.

International Institutions' Response to the Uruguay Round Agreements

The TBT and SPS Agreements have also caused modifications in the key institutions associated with them. Both the Codex Alimentarius Commission and the IPPC have undergone major changes as a result of the Uruguay Round. They have been modernized and made more relevant in international trade.

The Codex Commission is charged with implementing the Joint FAO/WHO Food Standards Programme. This Programme has dual objectives—protecting consumer health and ensuring fair practices in food trade by elaborating internationally acceptable standards for food. “Standards” are meant in the broadest sense—from specific standards applying to a single commodity to general standards for labeling, additives, food hygiene, and residue limits for pesticides and veterinary drugs as well as codes of good manufacturing practice.

The mandate of the IPPC is similar, but slightly narrower, aiming to protect plant resources in importing countries from harmful pests from exporting countries. The Convention has long-established the concept that exporting countries have an obligation to protect importing countries by insuring that exported agricultural goods are free from pests. The US and other exporters have, for many years, used a system of certification based on a model established in the Convention to assure foreign customers that their imports are free of harmful plant pests.

Although the Uruguay Round Agreements did not enter into force until 1995, it was clear earlier during the negotiations that the roles of Codex Alimentarius and the IPPC as the principal international instruments for food safety and plant health, respectively, would be included in the final agreement. In March 1991, the FAO/WHO Conference on Food Standards, Chemicals in Food and Food Trade made a series of recommendations, which now have largely been adopted, to prepare the Codex Commission for its expanded role in international trade.

These recommendations focused on the “horizontal” aspects of Codex work, like food additives, labeling, and hygiene as well as issues relating to the equivalency of import and export inspection and the process of establishing Codex standards. In the seven years since, most of these recommendations have been adopted or addressed and the work of Codex has become integral to the implementation of the SPS and TBT Agreements.

Since 1991, the Codex Alimentarius Commission has:

- Adopted new procedures for the elaboration of Codex standards, including an accelerated elaboration procedure;
- Taken steps to ensure that its standards, guidelines and other recommendations on food safety are soundly based on science;
- Begun the process of incorporating risk assessment principles into all its work on food safety and quality;
- Revised and published new, risk-based, General Principles of Food Hygiene which incorporate the Hazard Analysis Critical Control Point System into the overall recommendations for Good Manufacturing Practice;
- Finalized the first elements of the Codex General Standard for the Use of Food Additives;
- Reviewed, and revised or confirmed, Maximum Residue Limits for pesticides with the result that more than 50% of current Codex MRLs have been adopted or confirmed in the last five years;
- Revised its standards in the areas of Fish and Fishery Products; Fats and Oils; and Cereals and Cereal Products.

The IPPC has likewise undergone significant changes starting in 1993, following a series of recommendations from regional plant protection organizations. Although the IPPC has been in existence since 1952 and can trace its origins back to the *Phylloxera vastatrix* Convention in 1881, until 1993 it had no formal organization and no history of standard-setting apart from the convention itself and a glossary of agreed upon terminology.

In 1993 in anticipation of the SPS Agreement, the FAO Conference, the main governing body of FAO, established a Secretariat and interim standard-setting procedures for the IPPC. This has led to significant progress in completing a number of standards. However, these were interim measures. Many governments recognized that the Convention itself needed to be revised to meet the demands of the SPS Agreement.

Last November, after a two-year negotiation, the FAO Conference unanimously adopted a revised International Plant Protection Convention. This new Convention formally established a Secretariat and standard-setting procedures, including a Commission for standard approval and direction-setting in the IPPC. The provisions of the Convention were modernized and more

clearly stated to align them with the SPS Agreement in areas like pest-free areas, the use of risk assessment and harmonization.

The Future

The new status, which has been accorded to Codex under the SPS and TBT Agreements, has not been without some negative effects. Until there is a clear understanding of the implications of these two Agreements, Codex member nations will likely act very cautiously in approving new standards. In the short term this is slowing the Codex process for some controversial standards like BST.

The Codex tradition of arriving at consensus in its decision-making has also broken down in controversial cases. For the United States this has cut both ways. It was on the winning side in a close vote on the maximum residue levels for growth hormones in beef but was not successful in moving forward an MRL standard on BST and on standards for natural mineral waters.

The consensus tradition must be restored. Without it, meaningful progress on controversial items will slow to a standstill. It is especially important for Codex standards of relevance to the TBT Agreement where consensus on standards is specifically required. This matter of consensus decision making will be discussed in detail at the next session of the Codex Committee on General Principles.

Even with the limited number of WTO decisions on SPS disputes, countries are getting a clearer understanding of their obligations when Codex does adopt a standard or other text. A better understanding of the implications of recent WTO decisions should lead to an acceleration of the development of draft Codex standards which have been held pending.

However, it is now clear that the SPS Agreement cannot be interpreted to mean that all national regulations must "conform" to the requirements of Codex standards. Claims made to the effect that Codex standards have the force of international law, or are binding on Member countries, or automatically override national legislation and regulations, are false and even misleading. Nevertheless, the harmonization of national and international Codex standards remains a goal of the WTO Agreements, and countries which adopt Codex standards for their national regulations enjoy the status of these regulations being presumed to be consistent with the SPS Agreement.

Recent WTO decisions will also assist in the clarification of the role of science in Codex decision-making which will also be discussed by the next session of the Codex Committee on General Principles. The outcome of this discussion should give the Codex Commission the opportunity to differentiate between scientifically-based food safety and quality requirements and other attributes of food trade and consumer opinion, which affect the sale and distribution of foods.

In any case, there can be no doubt that Codex standards will continue to be based exclusively on scientific principles in all elements that deal with protecting the consumers' health and ensuring fair trade. Recent WTO decisions on the SPS Agreement have confirmed, for example, that factors such as the "precautionary principle" invoked by some consumers' groups, cannot be applied when a Member country applies a scientifically-based Codex standard.

As more cases are dealt with by the WTO, many of the uncertainties facing Codex Member countries will be clarified. This process is likely to be continuous and incremental, and as time goes by, it will strengthen the Codex process and the relationship between the way in which Codex elaborates its standards and the way in which Member countries apply them under the Rules of the WTO.

The future of the IPPC is less clear. It does not have a long record of standard-setting as does Codex but the revisions recently adopted to strengthen this role have set it on a path to be more effective in this area. These revisions require adoption by two-thirds of the member nations but this is expected within the next few years. When these changes are implemented the IPPC will have a solid structure to protect agriculture in importing countries from foreign plant pests while facilitating trade at the same time.

Conclusion

Effective implementation of the SPS and TBT Agreements requires, and contributes to, a well-functioning international system of food safety, food quality, and plant and animal health standards. FAO plays a critical role in this process but our success depends on a number of factors:

- cooperation among all parties involved—governments, food manufacturers, farmers, traders and consumers;
- consensus among governments—the international system is held together by shared commitments to reach common goals, without consensus the long-term stability of this system is in doubt;
- dedicated research by food scientists, agronomists, toxicologists, entomologists and other experts to assure that decisions by international bodies remain rooted in sound science;
- commitment to technical assistance to developing countries to bring their food control and plant quarantine systems up to international standards facilitating trade and protecting consumers and farmers everywhere; and
- adequate resources—FAO and other international bodies need sufficient funding to maintain the high priority given Codex and IPPC matters and the United States must pay its international commitments in full to maintain its influence in the decisions taken by these bodies.

EMERGING AND FUTURE BIO-ENGINEERED COMMODITIES

Kyd D. Brenner
Vice President, Corn Refiners Association, Inc.

Thank you very much for inviting me to visit with you today about the future for bio-engineered commodities. I am pleased to be able to share the podium with your other panelists and especially with Terry Medley who has been a key contributor to the acceptance and development of biotechnology in the U.S. agricultural marketplace.

Four years ago I had the pleasure of speaking to the Outlook Forum on the subject of the future of the corn sweetener industry. At the time I previewed a number of market developments which seemed to be of primary importance to the corn processing and sweetener industry - only about half of which have actually panned out. So, given that track record at predicting the future, I hope you will take what follows for what it is and not rush out to place your bets on any particular new technology.

In addition to the topic I have been asked to address, I would also like to comment briefly on what the changes in plant biotechnology may bode for our multi-billion dollar grain handling and logistics system. One of the traps we all fall into in looking at biotechnology is to somehow disassociate the technology part from the bio part. As exciting as molecular biology is, there comes a point when the hard economics of commodity delivery must be fully examined, including the balance between value addition and cost to each part of the commodity delivery chain.

First let's take a look at what we might be seeing in future bio-engineered commodities. For this purpose, I'd like to divide future products developments into three very broad groups:

- Products with improved production traits
- Products with improved output traits
- Crops which produce materials replacing other production systems

The area of improved production traits is suddenly almost a mature business. Starting with Roundup-Ready soybeans and Bt corn in 1996, insect and herbicide resistant crops have proved to be a big hit with U.S. farmers and their adoption is growing exponentially. And for good reason. These products, despite the steep technology fees associated with them, offer farmers tools to increase yields and lower costs with little change in agronomic practices. One seed company president recently predicted that the expected rate of adoption of insect and herbicide-tolerant crops could cut U.S. fertilizer and pesticide use in half by the year 2012. Given this degree of change it is little wonder that the major players in development of new crop technologies are the very companies whose chemical inputs may become less necessary in the future.

Beyond the headline crops, there are a number of new areas which we can expect to see in the market in the next few years:

- New forms of insect resistance. European corn borer resistance will be supplemented with resistance to other crop pests such as root worm, fall armyworm, black cutworm and southern corn borer.
- Herbicide and pest resistance will move from corn, soybeans and cotton into commodities such as wheat, sugar beets and sunflowers.
- Virus resistance and mold resistance will move from fruit crops into the major grain and oilseed crops. Fungal contamination, and its associated mycotoxin problems, may be dramatically reduced by varieties which resist stress induced by drought and insect invasion.
- The ability to help regulate changes and differences in water and soil quality will be introduced to major crops. Environmental factors such as drought and salinity have a marked effect on crop yields and quality and in coming years may be managed through hybrid selection. Minor changes in nitrogen fixation and utilization rates introduced through biotechnology are on the way.
- And, in 1998 we will see the first so-called "stacked" crop varieties incorporating both insect and herbicide resistance. Within the next few years, we can expect to see multiple stacked traits.

Crops with improved output traits are just coming to market this year. Nick Frey will discuss this type of product in much more detail later in the session, so I will just highlight a few of the possibilities of these crops. Five major types of output changes can be expected:

- Crops with increased amounts of macro-constituents. Crops designed to be high in traditional constituents such as oil, starch, sucrose or gluten may increase the value of crops to particular end-users such as swine feeders, starch and sugar processors and bakers.
- Crops in which the macro-constituents have been altered to increase their nutritional value or functionality. For example, high oleic-acid soybeans are coming to the market this year offering food processors oil with an improved nutritional profile.
- Crops in which micro-nutrients have been altered to improve nutritional properties. High lysine corn has been available for years from traditional breeding programs, but new technology may overcome cost problems. High lysine soy products should also be available in the next several years. Corn grain low in phytic acid may help animal feeders handle increasingly troubling animal waste problems.

- Crops which have been altered to improve quality and functional factors such as oil stability and flavor, starch and protein structure or fiber size and color.
- Crops which have been altered to improve their processing characteristics. Grain and oilseed processors operate highly capital intensive facilities designed to separate the oils, fiber, starch and sugars in crops and new technologies are being explored to enable plants to express these constituents in ways in which they can be extracted with less energy input and lower environmental impact.

Last in the development chain, and still several years away, are bio-engineered commodities which express entirely new products or functions not generally associated with agricultural production. These products fall in the area of what may be called "bio-factories" where the power of sunlight and plant physiology are harnessed to replace expensive chemical synthesis processes. In most cases these kinds of products are little more than twinkle's in the eyes of researchers. Unlike alterations which can be controlled by manipulating a single gene, or stacking several single gene traits, these products may require a new level of sophistication in genetic manipulation. These products fall into a number of areas:

- Biologically-based polymers which can be substituted for petroleum products. Soy and corn plants may one day produce polymers which can serve as intermediates in the production of degradable plastics, bio-fuels or replacements for synthetic fibers.
- Foods designed to be used in disease prevention. So-called "nutraceuticals" are currently being developed through traditional food fortification methods, but in the future vegetable, fruit and grain crops may be the vehicle for boosting intake of carotenoids, antioxidants, vitamin E, folates and other micronutrients which have been linked to prevention of cancer, coronary disease and degenerative nerve diseases.
- Crops designed to produce high-value pharmaceuticals and antibiotics. Pharmaceutical firms are actively investigating plant-based production systems which could replace traditional fermentation processes.

A key question which remains is, how will all of these new technologies be integrated into the agricultural system?

First, for any of these products to become successful they must add value over and above the products or systems they are designed to replace. For example, it will do little good to introduce high lysine products if lysine can be produced through fermentation and delivered to feed processors at lower cost than improved crop varieties. Herbicide resistant crops need to be more cost-effective than competitive weed control and tillage systems. In order to achieve this value addition, there must be financial incentives to five distinct segments of the chain:

- Technology and seed production companies
- Agricultural producers
- Commodity distributors

- Commodity processors
- End-users

At this point in the development of bio-engineered crops seed companies and agricultural producers clearly find value in these technologies. End-users such as commodity and food processors see opportunity but need to be convinced on a case-by-case basis that bio-engineered materials offer them increased value and not just an alternative route to make existing products. In the middle lies the huge commodity gathering and distribution system which has been designed to deliver large volumes of undifferentiated crops to end-users. So far, the commodity gathering network has taken only tentative steps to develop systems for handling bio-engineered products.

Even with the development of major bio-engineered crops, traditional commodity corn markets will always exist. The system we have built over many hundreds of years is the source of a high quality raw material, available every day of the year, in almost any location. While processing industries adapt new technologies, there is a large base of business which is absolutely dependent on this commodity market.

Beyond the current system, there are certainly new modalities developing which I would categorize into two new grain marketing systems.

One such system will be necessary to handle the new value-added grain and oilseed products. The nature of these crops provides an intrinsic value above commodity products, but the potential scale of the market is such that absolute isolation or segregation systems are not feasible, nor necessarily required to protect product quality. A delivery system utilizing existing elevator capacity which could be rotated through a variety of specialty crops could serve this function, and will certainly be the domain of existing elevator operators. A key determinant in how this system develops will be the availability of rapid analytical procedures to measure the constituents of these new grain varieties.

A second new system will be required to deal with the bio-polymer, pharmaceutical and nutraceutical type crops. The extremely high value of the products produced by such crops should be adequate to allow new capital expenditures for strict segregation systems, and the products contained in these crops will not be suitable for inclusion at even low-tolerances in commodity grain supplies. This kind of system may not end up being operated through current grain marketing channels, but will probably rely on direct farm to processor contracting and delivery. The traditional functions of risk management performed by the grain trading system will not necessarily be applicable to these kinds of crops. In some cases the actual crop production may not be the domain of traditional agricultural producers but may be a function of the processor or end-user.

I appreciate the chance to share this snapshot of where we're heading with bio-engineered crops with you and look forward to participating in the panel discussion.

Biotechnology Issues for Crop Producers

Steve Wentworth
Vice-President
Foundation EARTH

I come from a long line of Macon county Illinois farmers who have adopted emerging technologies over the last 130 years to improve their farms. In the 1870's my great-great grandfathers saw how John Deere's steel moldboard plow could enhance the productivity of sticky Illinois prairie soils. They soon realized Cyrus McCormick's reaper would allow them to harvest more grain in a day. In 1870, 53% of the US population were farmers. By the turn of the century, my great grandfather used the power of steam engine to run a threshing machine. At the turn of century, 37.5% of all US workers were farmers; by 1920 that percentage had dropped to 27%. When A.E. Staley Company of Decatur Illinois first started processing soybeans in October 1922 it profoundly changed my grandfathers' crop rotation and all of US agriculture. Soybeans were no longer a hay crop or a nitrogen source to be plowed under, but a cash crop. With the use of hybrid seed corn starting in the 1930s, Macon county farmers saw a tremendous increase in yield. During that the same decade gas powered tractors were used for the first time to till the soil.

In 1950, the year I was born, and two years after my father started farming, 11.6% of the working population of this country were farmers. During my Dad's farming career, he saw our farm's productivity zoom through the use of soil testing, greater use of commercial fertilizers, herbicides to control yield robbing weeds, insecticides to prevent disastrous insect infestations, advances in electronics that allowed more accurate planting, spraying and harvesting operations. By 1970, only 3% of the US work force were farmers.

Since 1974, the year I started farming, we have gone from moldboard plowing to soil conserving minimum tillage and No-till. Back then our big tractor was a state of the art John Deere 4430 with 125 horsepower, now our large tractor is a Case 9370 with 365 horsepower. The John Deere 4400 combine we used in the early 70's would harvest 4,000 bushels of corn in a big day. With our current John Deere 9600 it is not uncommon to shell 20,000 to 22,000 bushels of corn a day. The machine that is used the most on our farm is the computer. We are currently on our fifth computer. Unlike combines that do wear out, computers are obsolete minutes after you walk out of the store. In the past it took 8 to 10 pounds per acre of herbicides to get satisfactory weed control. Now, as little as 4 ounces per acre of the new generation herbicides will give a farmer a weed free field. When I started farming I would spread the same analysis of fertilizer across an entire field.

For the last few years I have been using variable rate fertilization technology coupled with Global Positioning to apply phosphate and potash in the most economically optimum ration for that exact location in the field. My combine is now equipped with a yield monitor and a GPS unit so I know what every square meter of a field yields. Now the challenge is to interpret the data, and determine what causes the differences between the lowest yielding areas and the highest areas. Precision farming combined with the advances in biotechnology promises to further speed the incredible rate of change in production agriculture.

Advances in technology have allowed me and the rest of American agriculture to become more productive and environmentally sustainable at the same time. Currently, less than 1.5% of working Americans are farmers. I believe biotechnology holds a promise for even more improvement, but should not be viewed as some kind of a silver bullet solving all of agriculture's problems. Each of technological advances I have described over the last 130 years have created both new opportunities and management challenges for the American grain farmer. None of these advances were problem free or easy. Likewise, the use of transgenic crops is extremely promising, but it would be naive for anyone to believe there are not tough issues to be dealt with.

Roundup Ready soybeans have been probably the most visible of the early transgenic crops. 1998 will be the third year I have grown Roundup Ready soybeans. The rapid acceptance of this technology has been nothing short of astonishing. Representatives of some of the leading seed companies tell me the market share of Roundup Ready has grown from 0 in 1995 to over 60% for the 98 growing season. They expect in 1999 over 75% of all soybeans they sell in this country to be Roundup Ready.

If we look at the economics involved, it is easy to understand why this new technology has gained such a rapid acceptance among farmers. On my conventional soybeans, before planting I apply a pre-emerge grass herbicide followed in June by postemerge broadleaf chemical at a cost of \$38 per acre for the chemicals plus two applications at \$4.50 each per acre for total expense of \$47 per acre. With Roundup Ready soybeans I spend \$13 per acre for the Roundup and \$4.50 per acre for a single application. Monsanto collects a technology fee of \$5.00 per 50 pounds of Roundup Ready seed used. This amounts to \$5.00 to \$7.50 per acre depending on seed size and planting rates. Overall, I am saving \$22 to \$24.50 per acre, which on our farm's 1300 acres of soybeans is a \$28,000 to \$31,000 cost reduction. Roundup kills a wider spectrum of weeds while at the same time being gentler on the growing beans. It is obvious why Roundup Ready soybeans have gone from nothing to over 60% market share in 4 years.

There are number of management issues about Roundup Ready soybeans that farmers need to address. If any conventional beans are planted in a Roundup Ready field or sprayer operator treats the wrong field all of those soybeans will die. If the winds are too strong or out of the wrong direction a neighbor's corn, or worse, his wife's tomatoes will be destroyed. This year, for the first time, Dekalb is offering Roundup Ready corn. If a farmer plants any of these fields to Roundup Ready soybeans in 1999, any volunteer corn growing in his soybean field would also be resistant to Roundup. If farmers kept using Roundup on both their corn and soybeans for years, in theory, it would be possible for a weed to develop a resistance to the chemical. The Monsanto people say the chances of that happening are almost nil.

There has been much debate in farm circles this fall and winter if Roundup Ready soybeans yield as well as conventional beans. From the data I have seen and my own experiences, I am convinced that the best Roundup Ready soybeans will yield with any conventional variety. Seed companies are working feverishly to get the Roundup Ready characteristic into their best genetic package.

For years farmers planted soybeans saved from the previous crop for seed. This practice is called using "bin run seed". Over the last 25 years farmers have increasingly purchased new seed every spring to insure themselves of the best genetics and the highest quality. Today, when a farmer buys a bag of Roundup Ready soybean seed he pays the \$5 technology fee that goes to Monsanto and he signs an contract that he will not keep any production back for seed. If he is caught in

violation of this agreement he can be fined over \$1,000 per acre. Most producers understand that the tech fee allows Monsanto to recover their previous research costs, give a return to the stockholders, and provide research dollars for the development of future transgenic crops. But, it is a new and difficult mind set for a few farmers that those soybeans he just harvested cannot be kept for seed.

The European corn borer does more economic damage than any other insect to corn, with losses and control costs exceeding \$1 billion annually. The decision on whether or not to grow Bt corn is not as clear cut as it is with Roundup Ready soybeans. A central Illinois farmer knows with a great deal of certainty what the weed pressure will be in his soybean fields, but the reliability of predicting the level of European corn borer infestation before planting is not very consistent. The severity of the previous winter; a farmer's and his neighbor's tillage; the timing, velocity, and direction of summer and fall winds; and number and strength of summer thunderstorms all impact corn borer survival. Farmers in the Western Corn Belt usually have greater corn borer economic losses and on a more regular basis. Integrated pest management (IPM) offers some defense against European corn borer, but is not practiced to any great degree. IPM requires skillful scouting multiple times in extremely uncomfortable conditions and is very time consuming. Even if economic levels of corn borer are detected, the treatment insecticides are expensive and not always very effective. There also can be health and environmental concerns. Beneficial insects will be reduced.

Bt corn basically offers a corn farmer an insurance policy against moderate to severe infestations of European corn borer. Bt, *Bacillus thuringiensis*, is a naturally-occurring soilborne bacterium. Bt produces crystal-like proteins that kill certain insects when ingested. Plant geneticists create Bt corn by inserting selected exotic DNA into the corn plant's own DNA. This is called an "event". The EPA has registered four unique events for commercial use: 176 (Novartis Seeds and Mycogen Seeds), BT11 (Northrup King/Novartis Seeds), MON810 (Monsanto) and DBT418 (DEKALB Genetics Corp.). Event 176 hybrids produce Bt protein only in green tissues and pollen, whereas BT11 and MON810 produce Bt protein throughout the plant. While all the events do control corn borer larvae, but to different degrees.

Bt is a defensive characteristic. Putting Bt into a corn with mediocre genetics isn't going to make that variety great. Giving me the latest set of Calloway Big Berthas won't make me a better golfer than Tiger Woods with 1950 vintage irons. Also some corn varieties, such as Pioneer 3489 or Garst 8481IT, can tolerate more corn borer injury than others. As a farmer, I need to decide if the extra \$14 to \$15 per acre I will spend for Bt corn is justified. This spring, I will be planting my first Bt corn on about 5% of my acres. The yield monitor on my combine will show me how these Bt corns perform against my favorite non-Bt hybrids in 1998. But that will be no guarantee of Bt being advantageous in 1999. My best guess is that as more companies start putting Bt into their highest yielding genetics the market share of Bt corn will grow dramatically.

The concern of farmers, seed companies, universities, and others is that European corn borer will develop resistance to Bt if growers start planting whole farms to corn with this technology. To prevent this farmers are being advised to plant Bt only on acres where there is risk of severe infestations. Also, corn farmers are instructed not to plant any single field to more than 75% of Bt varieties. Planting a 25% refuge of non-Bt-corn will allow susceptible European corn borers to mate with potentially Bt-resistant corn borers. If not managed properly, Bt-corn will be a short-lived benefit to corn farmers. Future transgenic crops, like rootworm resistant corn, will

not be released unless farmers show good stewardship of biotechnology products such as Bt-corn.

Farmers are intently following the rapid structural changes of the companies selling them inputs. They are asking themselves, what does it mean to us for Monsanto to purchase Asgrow and Holden seed companies or for DuPont to buy 20% of Pioneer? Is it good or bad? Only time will tell. What is obvious, is that biotechnology is the primary catalyst. The first generation of biotech traits have been input related. What is truly exciting for me as a farmer is the prospect of biotechnology increasing the value of my corn and soybeans. Maybe because of biotechnology I will be growing a different commodity. Crops will be genetically engineered to replace materials that now come from petroleum such as chemicals, fuel, and plastics. Transgenic crops have great potential in animal health, nutraceuticals, and pharmaceuticals. For generations American farmers have adopted to changing technologies. The rate of change facing farmers today is truly incredible. Biotechnology is another tool for farmers to utilize to bring abundance to America.

GRAIN OUTPUT TRAITS — END USE AND CONSUMER BENEFITS

Nick Frey, Vice President, Food/Oils
Optimum Quality Grains, L.L.C.

It is a pleasure for me to be here this afternoon to offer the outlook of Optimum Quality Grains on the emerging transformation of grain and oilseeds. The agri-food industry approaches the new millennium facing two fundamental challenges:

- 1.) Producing sufficient quantities of food to support a global population that is increasing at the rate of 100 million people per year.
- 2.) Improving the quality and functionality of food to improve the health and nutrition of our global family.

Study after study in recent years has made it abundantly clear that there is a strong link between diet and human health. For example:

- Saturated fats have been associated with the buildup of serum cholesterol, a leading indicator of heart disease.
- There is a growing body of medical evidence that trans fatty acids actually raise the levels of LDL, the so-called bad cholesterol, and reduce the levels of HDL, the good cholesterol.
- There is growing evidence that the isoflavone composition of soybeans can prevent or reverse the debilitating disease, osteoporosis, and reduce risks of certain kinds of cancer.

Optimum Quality Grains is the new joint venture of DuPont and Pioneer Hi-Bred International. Our core purpose is to improve the world's food supply through customer-driven innovation.

We begin our work at the convergence of a number of important market trends.

- An unprecedented consumer-driven influence in product and service creation;
- An evolution in technology and innovation from 100 years of dominance by physics and chemistry, to the age of biology, biotechnology and information;
- The coming together of very diverse and yet synergistic market participants as partners;
- A rapid expansion of global opportunities all around us; and
- A growing desire among food companies and consumers for improvements in food functionality, healthfulness and flavor.

It is into this environment that Optimum Quality Grains hopes to lead the world in creating and providing value-enhanced ingredients derived from unique grain and oilseeds to meet specific customer needs for food, feed and industrial uses.

Biotechnology offers a unique opportunity for us to shift the market paradigm from one that is driven by supply (commodities) to one that requires demand-driven product differentiation in production agriculture.

Consumers want ingredients that provide good-tasting foods and need those foods to provide good nutrition that helps sustain their health. But, most consumers are confused about nutrition, and this is especially true as consumers try to balance consumption of foods containing oils and fats.

Thus, we struggle to commercialize new and improved vegetable oils that can address health and nutrition concerns about serum cholesterol levels and risks of coronary disease while providing foods with the same great taste we have always enjoyed.

In order to provide the flavor consumers expect and the performance food manufacturers and food service providers seek to control quality and cost, most vegetable oils now used for frying are hydrogenated. The only alternatives are coconut, palm and cottonseed oil or tallow and lard, which are high in undesirable saturated fats.

We already have introduced two new soybeans with oils that meet the flavor, nutrition and stability requirements consumers and food companies want and that offer lower saturated fat or are naturally stable, eliminating the need for hydrogenation that forms trans fatty acids.

One of these products is high oleic soybeans. These soybeans will be produced on approximately 25,000 acres in 1998 and will produce an oil that:

- Is 30-40 percent lower in saturated fat than normal soybean oil;
- Is resistant to oxidation, extending shelf life of oil-containing foods;
- Offers better flavor stability and is less likely to become rancid;
- Reduces the need for hydrogenation, thus eliminating trans fatty acids; and
- Offers excellent fryer life in frying applications.

Optimum high oleic soybean oil could replace most hydrogenated soybean oil now used in frying or as spray oils for shelf-stable foods.

Optimum, in partnership with Iowa State University, also introduced LoSatSoy™, an oil that contains 7 percent saturated fat, about half the saturated fat of normal soybean oil.

About 13 billion pounds of soyoil are consumed in the U.S. each year. If LoSatSoy™ were to be used, and the 7 percent reduction in saturated fat was achieved in all applications, over 900 million pounds of saturated fat could be eliminated from the American diet.

That 900-million-pound reduction equates to removal of over 3 pounds of saturated fat from the diet of every man, woman and child in the United States without changing the foods we eat and enjoy. Wouldn't that be an important dietary change for consumers and a positive public health initiative for America?

The USDA has responded to this new product opportunity and is evaluating LoSatSoy™ for use in the School Lunch Program as one of the ways it can balance its menus to meet statutory requirements that assure the healthfulness of government meal programs.

LoSatSoy™ can play a significant role in meeting dietary requirements for mayonnaise, salad dressing and the liquid oil portion of margarine.

The USDA should be commended for its pioneering efforts to provide LoSatSoy™ through the school lunch and other programs.

High oleic soybean oil also offers tremendous potential for improving the healthfulness of fried foods. We estimate over 50 percent of all soybean oil consumed is partially hydrogenated, largely to improve stability of the oil in commercial fryers or in shelf-stable foods. High oleic soybean oil is inherently stable without hydrogenation. Optimum is working with the United Soybean Board to create greater awareness of the benefits from this new soyoil.

Optimum Quality Grains also is introducing high sucrose soybeans that offer improved flavor and digestibility of soymilk and other soy food products. High sucrose soybeans lack the indigestible carbohydrates stachyose and raffinose that can cause abdominal discomfort and gas.

Consumers have often sacrificed flavor or eating enjoyment to achieve a healthier diet. By improving the nutritional profiles of foods and food ingredients without sacrificing taste or texture, we are eliminating barriers to more healthful diets. Consumers will be able to obtain the benefits of improved oil profiles and the natural benefits of soy foods while satisfying their taste and texture preferences.

Our purpose at Optimum is to bring superior ingredients from the existing agricultural system to consumers around the world. Food companies respond to consumer demands for flavor, variety and convenience in the foods they eat, and now with the advances being made to improve ingredient oils and proteins, these foods can offer better nutrition, as well.

Agriculture is poised to respond to these new demands – creating new opportunities for producers, processors, and consumers.

Agricultural systems in place today are not customer driven, but cost driven. The marketplace defends this cheap food paradigm by saying that the customer is unwilling to spend more for healthier products. But, these new ingredients will cost more than the low priced commodities they will replace.

Numerous studies have shown that consumers are eager to spend more for products that more closely meet their needs. Consumers pay for quality in clothes they wear, cars they drive, and

the computers they buy. They purchase health club memberships to improve their condition and health.

What rationale exists that says consumers will not also buy healthier food if given the choice and if it still tastes great?

Customer-driven innovation -- that is the paradigm that must drive all of agriculture in the new millennium. The technologies are available to improve our feed and food ingredients and to produce and deliver these improvements through today's commodity systems.

We can offer consumers new choices for flavor, variety, convenience, nutrition and health in foods they eat. By improving the nutritional quality of food, we can improve the quality of life for the consumers we in business depend on.

--Thank you

**Cultivating New Ground:
Organic Agriculture Arrives at the Outlook**

Mark D. Lipson
Policy Program Director
Organic Farming Research Foundation

Welcome to the first-ever session devoted to the organic foods marketplace at the Outlook Forum. This historic, perhaps belated recognition marks a number of "New Frontiers". After 25 years of formal identity in the marketplace, and 50 years of deliberate development on commercial farms, the organic food and fiber sector stands at the beginning of a new landscape, a new expanse of ground to open up, with promise of fabulous success, but also the potential for tragic disaster. The organic industry is a unique and complex phenomenon. Given the lack of precedent for its discussion at this forum, it may be difficult to do justice to the many issues which pertain to our general subject. However, the conference organizers have assembled a stellar panel, including both long-term pioneers in the organic movement and far-seeing contemporary scouts of the new territory we will be exploring.

The panel will focus mainly on the frontiers of the marketplace. These frontiers include dynamic expansion on multiple fronts, including domestic mass markets, high-unit-value international trade, a newly muscular "natural foods" retail chain sector, and a diverse explosion of local-scale innovations in direct marketing and value-added entrepreneurship. Between them, the panelists will cover this spectrum and probably more.

Intersecting Frontiers: the Marketplace, Agricultural Research and Public Policy

To set the stage for our analysis of the organic marketplace, allow me to briefly suggest two other intersecting frontiers that help form the context of our discussion. The first area I refer to is agricultural research, and the second is that of public policy.

The sustained rapid rate of growth in the organic sector has taken place with essentially no meaningful assistance from the U.S. agricultural research and extension system. At the Organic Farming Research Foundation (OFRF), we recently published a study of USDA's research database with respect to its "organic content". We found that the bare handful of federally-funded projects that are explicitly focused on understanding or optimizing organic farming constitute about one-tenth of one-percent (0.1%) of USDA's research portfolio, in both numbers of projects and their share of the research budget. This amounts to little more than random noise among our vast scientific endeavors in agriculture. Virtually no specific production research, no more than a token gesture towards market research, and a few ill-informed "comparisons". It is an understatement to say that no other agricultural sector of any size has flourished with such a total absence of public research support (at least in this century).

Despite this neglect, there are economically successful organic producers of every scale, of every crop, in every state of the union. They produce competitive yields of exceptional quality. In its

advanced forms, organic farming encompasses the cutting edge of biointensive, ecologically-based production systems. We know that organic farming does work, can work spectacularly, but we understand very little about how it works. The distinct agronomic premises and operating principles have only been articulated in a rudimentary way. Yet, ironically, organic farms are providing strategies, organisms and genetic source material for many current efforts to develop biopesticides, recombinant-DNA products, and pesticide use-efficiency schemes. While these isolated extractions will probably have only short-term success, the potential for optimizing adaptive, biologically resilient organic systems remains largely untapped. The ten thousand or so organic farms in the U.S. represent alternative patterns of agricultural success waiting to be translated into researchable scientific questions. If and when this happens, we will see dramatic improvements in the productivity, reliability, and cost-effectiveness of organic agriculture. The impact of such developments upon the marketplace can only be imagined, and perhaps the panel will explore this.

So the scientific frontier lags well behind the marketplace in its acknowledgment of the organic sector. This is both a problem of scientific capacities, as well as a problem of public research policy; which brings me to the third frontier.

Public Policy and Organic Agriculture

The results of the OFRF study and our policy recommendations appear in the booklet entitled, *Searching for the "O-Word"*. This report has been submitted to the Deputy Secretary and the Under Secretary for Research, Education and Economics. While there has been little response from the department as yet, the call for organic farming research has been taken up by Congress.

The House version of the Research Title reauthorization includes a provision for an organic agriculture research initiative, authored by Rep. Sam Farr (D-CA) and passed by consent of the House Committee on Agriculture. The final Senate version of the Research Title includes report language recognizing organic farming research as a neglected but deserving subject of the research system.

The arrival of bipartisan political support for organic farming research is, by itself, a watershed event. But it provides another illustration of the lag between the market and other institutions. Recent Congressional policy endorsement of organic research is practically the first federal governmental word on the subject since 1981, when a cautiously positive internal USDA report on the potential of organic farming was rejected, repudiated, and buried by the department's top leadership. That brief flirtation was an exception to official pronouncements that have equated the pursuit of organic farming with mass starvation. That ideological view, expressed clearly by Secretary Earl Butz in the late 1960s, is still repeated in high policy circles today: an unscientific myth taken as gospel. It may yet be years before there is significant organic farming research underway, but we are clearly moving into new territory and organic farmers are used to appreciating things on an extended time-frame.

Similarly, we have just reached a critical juncture in another long process of institutional recognition. I refer, of course, to the Proposed National Organic Program Rules published for public comment by USDA on December 15. Seven and a half years after the Congressional

passage of the Organic Foods Production Act, and after nearly six years of work by the Department's appointed Standards Board, the Proposed Rules mark the first tangible manifestation of federal policy with respect to organic production and products.

It's no secret that the organic industry and its customers have reacted with vehement disaffection for the proposal. To put it very briefly, neither of the two main goals which we expected to be addressed by the rule seem to have been achieved. The first goal was to codify a consistent basic standard based on the similar (but not identical) rules in use over the last 25 years by a dozen or so states and some 30 non-governmental certification programs. The second was to provide cost-effective public oversight of organic labeling and certification claims. Instead, it appears to most of us that our common historical standards have been heavily reinvented, while the proposed certification system is extremely problematic and probably unworkable. Basic aspects of the Standards Board's determinations were not incorporated into the published proposal.

While this is not the time or place to dissect the proposed rules, their likely implications for the marketplace cannot be excluded from our analysis today, and I expect our panel to provide some assessment of this topic.

So, the backdrop of our discussion today is the shifting relationships among these three frontier zones: the market, the research system, and the government's policy framework. They are each proceeding at vastly different rates of speed and the resulting conflicts and contradictions will greatly affect the shape of things to come.

[Introduction of panel and presentations.]

In closing, I will offer a final observation. America wants there to be an organic food system. Consumers want to have the choices available that organic foods represent. They want organic farming to succeed in achieving competitive yields and reasonable mass consumption prices, and they are willing to support that with their product purchases and their tax dollars for research. USDA can help to realize these goals. Help us to cultivate this new ground and bring the Department along into the new frontier of organic agriculture.

ORGANIC FOOD MARKETING TRENDS

Gene Kahn
President and CEO
Cascadian Farm

Agenda



Small Planet
Foods

1. Quarter-Century Perspective on the Organic Industry.
2. Six Forces Driving Organic Growth.
3. Key Priorities Looking to the Future.

6 Forces Driving Growth in the Organic Industry



Small Planet
Foods

- I. Environmental Awareness.
- II. Relationship Between Diet & Health.
- III. Declining Cost of Organic Food Production.
- IV. “Mainstreaming” of Organic Consumers, Products and Retailers.
- V. Worldwide Harmonization of Organic Standards.
- VI. Capital Investments from Financial Community.

Quarter-Century Perspective on the Organic Food Industry



Small Planet
Foods

- 1972 to 1998 = Phenomenal changes:
 - Organic agricultural scale, practices, professionalism.
 - Range and excellence of organic foods.
 - Mainstream interest and acceptance.
- The road from anti-business to embrace of business:
 - Conventional farmers are friends and allies, not enemies, to the organic movement.
 - However, many organic Ag advocates and conventional Ag advocates still mistrust each other.
- National Organic Standards mark a “coming of age”:
 - Organic is integral part of Ag and food industry.
 - Organic principles have moved from the fringe closer to the center of the national agenda in Ag and food.

6 Forces Driving Growth in the Organic Industry



**Small Planet
Foods**

I. Environmental Awareness.

- ➡ The price we pay for food does not reflect true cost of production.
- ➡ Environmental costs of agriculture are deferred to future generations for payment.
- ➡ Assumption: Informed and concerned consumers will associate sustainable & organic farming with the solution to the above problems. Increased education will accelerate this trend.

6 Forces Driving Growth in the Organic Industry



**Small Planet
Foods**

II. Relationship Between Diet & Health.

- ➡ Many major health problems are linked directly to diet.
- ➡ As health costs explode, increasing attention will be focused on preventative changes in diet and health.
- ➡ According to former Surgeon General C. Everett Koop:
"Good diet, prevention and health promotion can postpone 79% of all premature deaths, while traditional medicine postpones no more than 15%."
- ➡ Assumption: Natural and Organic Foods will benefit substantially from increased awareness of the link between diet and health.

6 Forces Driving Growth in the Organic Industry



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III. Declining Cost of Organic Food Production.

- Increased awareness and trial of organic foods will increase sales and production.
- “Label Cancellation” will withdraw many ag. chemicals from the market, forcing farmers to consider alternative growing methods including organic farming.
- Advances in organic farming technology will increase the availability and use of bio-control of insects and disease.
- Larger, more established food companies will enter the organic food business.
- Distribution & Freight costs will decline as industry volumes approach critical thresholds.

6 Forces Driving Growth in the Organic Industry



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IV. “Mainstreaming” of Organic Consumers, Products and Retailers.

A. Consumer Trends.

- Current consumers, especially Baby Boomers, are more aware of the links between diet, health, agriculture and the environment.
- As shown in the recent Hartman - New Hope study, a healthy % of consumers are “Organically Involved” or “Organically Attracted.”
- Consumer perceptions of “Organic” vary widely:
 - For large % of consumers, “organic” is linked with simple, qualitative ideas & benefits.
 - A much smaller % knows specifics about organic foods:

6 Forces Driving Growth in the Organic Industry



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IV. “Mainstreaming” of Organic Consumers, Products and Retailers (cont’d).

B. Organic Products have Improved Greatly.

- Taste is much better than before.
 - Much more innovation
 - Better & more consistent supply.
 - Better R&D and Food Science technology.
- Packaging, Graphics, Brand Positioning, etc. have generally become more mainstream in appeal.
- Prices gaps between organic and conventional foods have narrowed considerably:
 - Price gaps vary greatly by category.
 - As further narrowing of price gaps occurs, other categories will progress from niche appeal to mainstream appeal.

6 Forces Driving Growth in the Organic Industry



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IV. “Mainstreaming” of Organic Consumers, Products and Retailers (cont’d).

C. Growth of Retail Outlets for Organic Products.

- Major natural food retailers are expanding stores and markets.
- Larger, newer natural foods stores have brighter, friendlier, more mainstream layouts.
- Major grocery chains are entering the organic category in order to compete with natural foods retailers.
- Larger, newer natural foods stores feature more frozen freezer display space.
- Organic products are gaining distribution in conventional grocery retailers.

Growth of Major Natural Food Chains



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⇒ Capers (BC)

⇒ Puget Consumers
Coop

⇒ Whole Foods

⇒ Nature's Northwest

⇒ Whole Foods
/Fresh Fields

⇒ Bread & Circus

⇒ Wild Oats

⇒ Whole Foods

⇒ Wild Oats

⇒ Fresh Fields

⇒ Wild Oats

⇒ Wellspring

⇒ Whole Foods

⇒ Bread of Life

Competitive Advantages:

1. Size, Scale, Market Share.
2. Broader, Deeper Product Lines.
3. Draws Larger, Mainstream Consumer Base.
4. Advanced Systems & Operations.



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Case Study - Whole Foods Markets

A. Financial Performance:

	<u>1991</u>	<u>1997</u>	<u>% Chg</u>
Sales (MM)	\$92.5	\$1,100	+ 1108%
Net Profit (MM)	\$1.6	\$26.6	+ 1563%
# Regions	2	8	+ 300%
"Team Members"	1,102	11,268	+ 923%
Donations	\$63,000	\$1.3 MM	+ 2000%

Whole Foods Market - cont'd



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B. Quality Standards:

“We feature and prepare foods that are free of artificial sweeteners, colors, flavors and preservatives.

We actively seek out and support sources of organically-grown foods.

We feature seafood, poultry and meat that are free of added growth hormones, antibiotics, nitrates or other chemicals.

We Feature grains and grain products that have not been bleached or bromated.

We do not sell food that has been irradiated.

We sell only household and personal products that have been proven safe through non-animal testing methods.”

Source: Company Financial Reports

6 Forces Driving Growth in the Organic Industry



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V. Worldwide Harmonization of Organic Standards.

- United States: Organic Food Production Act of 1990.
- World Health Organization (U.N.): Development of Organic Standards in the Codex Alimentarius Commission.
- European Economic Community.
- International Federation of Organic Food Movements.
- Assumption: Harmonization of world standards can strengthen and authenticate organic declarations and claims, giving consumers world-wide a clearer understanding of the benefits of organic food.

Key Priorities Looking to the Future



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- Scientific Validation of Organic Benefits:
 - Water & Soil Quality.
 - Pesticide Safety.
 - Food Safety.
- More & Better Consumer Communications:
 - ↳ to bring in a larger consumer base.
 - Advertising.
 - Public Relations.
 - Industry-wide ads & education programs.
 - Consistent organic standards in keeping with consumer expectations.
- Cost of Goods Improvements:
 - ↳ to lower price gap vs. conventional foods.
 - Organic Ag. research.
 - Manufacturing infrastructure.
- Continues Quality Improvements and innovation:
 - Better quality assurance.
 - Higher and more consistent raw product specifications.
 - Innovation, newest trends, consumer behavior, etc.

6 Forces Driving Growth in the Organic Industry



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VI. Capital Investments from Financial Community.

- Organic & natural products industry is now large enough to generate considerable interest from major financial investors.
- Financial investors have made financial commitments in several prominent organic and natural foods companies:
- Capital inflow from investors has significantly spurred growth for the companies in question.
- Financial investments have raised the overall visibility of and interest in the industry.

THE EVOLVING ORGANIC MARKETPLACE: EXECUTIVE SUMMARY

Harvey Hartman
Hartman and New Hope
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ORGANIC CONSUMER INTEREST AND PURCHASES

The organic industry is growing rapidly, and changing at its root, but it has barely tapped its potential. The \$3.5 billion U.S. organic market has been doubling in size every 3½ years since 1990, yet the nationwide consumer survey conducted for this report indicates that the current 1-1½% market share held by organic foods products is still a tiny fraction of the organic market's potential. 18% of U.S. consumers are strongly interested in buying organic products, 28% are generally interested, 16% ambivalent, and 40% uninterested. The substantial purchase interest for organic products is buttressed by actual product purchases as well. Forty-eight percent of survey respondents could name (without assistance) at least one organic product they'd purchased "in the last year or so", while 18% could name two products, and 9% could name three or more.

CONSUMER UNDERSTANDING OF ORGANIC PRODUCTS

However, while they state an interest in and actually purchase organic, consumers do not necessarily understand what "organic" means, though three-quarters of them have at least some notion. Most consumers think about organic products in terms of being natural, or of being grown without toxic pesticides, chemicals, or artificial ingredients. In reality the definition of organic is more systemic and subtle. Organic refers to an entire system of agricultural practices that build up the natural health of the soil and water without the use of *synthetic* chemical applications. The subtleties of the organic process may create consumer confusion in the future, especially as the proponents of several other forms of "sustainable" agriculture

promote their versions. Indeed, because organic methods technically allow the application of *naturally occurring* toxic chemicals, a potential exists for consumers – who tend to fixate on pesticide issues – to feel betrayed by organic claims, even though organic methods are the *most* environmentally sound in existence today. In the meantime, most consumers tend to equate "organic" with environmental and personal health attributes, which parallels the image of organic as portrayed by the industry.

MARKET ATTITUDES AND PREFERENCES

The desire for organic products is far from being a superficial fad. Rather, statistical analysis of the Hartman & New Hope Organic Survey shows demand for organic to derive from a set of very fundamental value changes occurring in the culture. These "organic-oriented" values include growing concern for personal health and emphases on community, spirituality, nature, integrity, feminine perspectives, and caretaking in general.

Consumers rank taste, healthfulness, availability, environmental friendliness, and price as their most important purchase criteria for organic products. In this context, we have identified four key barriers to expanding the organic marketplace. These barriers are, in order of importance: *awareness, availability, price, and quality*. While most people have some awareness of organic products (even if it be mistaken), it is rarely something people think about – even among the majority of people who have positive health associations surrounding organic foods. Without more "top-of-mind" awareness, the current advances in availability, price, and quality will not bear the fruit they otherwise could. Availability is a great barrier to increased organic sales because 80% of consumers who are

interested in organic products would prefer to buy them in mainstream grocery stores, where few organic products are currently offered. Nevertheless, trends are under way that should multiply the mainstream availability of organic products. Price is also a barrier to organic purchases. Currently premiums average from 20% to more than 100%, and though few products are completely price competitive, price premiums are definitely trending downward over time. Many consumers claim price is not a barrier for them, yet few follow through with this attitude in practice. A large majority say that they would buy *a lot more* organic products if the price was competitive. Nevertheless, price need not be an obstacle for growth in market share for many if not most organic products. This report documents many different strategies available to either reduce prices, or successfully pass on premiums. Quality would be a serious barrier to more organic sales, except that companies have made great strides in the last few years to improve the taste, appearance, and packaging of organic foods. Quality is on its way to being turned from an obstacle to a value-added benefit of organic foods.

As consumers become more conscious of organic products and their benefits, and as companies continue to break down awareness, availability, price and quality barriers while adding increasing numbers of new products, the organic purchase criteria of consumers is likely to change over time. This is just one of many trends that merit the on-going attention of organic marketers.

ORGANIC CONSUMER SEGMENTS

By jointly analyzing the purchase interest, buying behaviors, and purchase criteria of survey respondents, we identified four consumer segments and two subsegments that display remarkable and consistent differences in their attitudes, understandings, shopping preferences, behaviors, and interpretations of key bar-

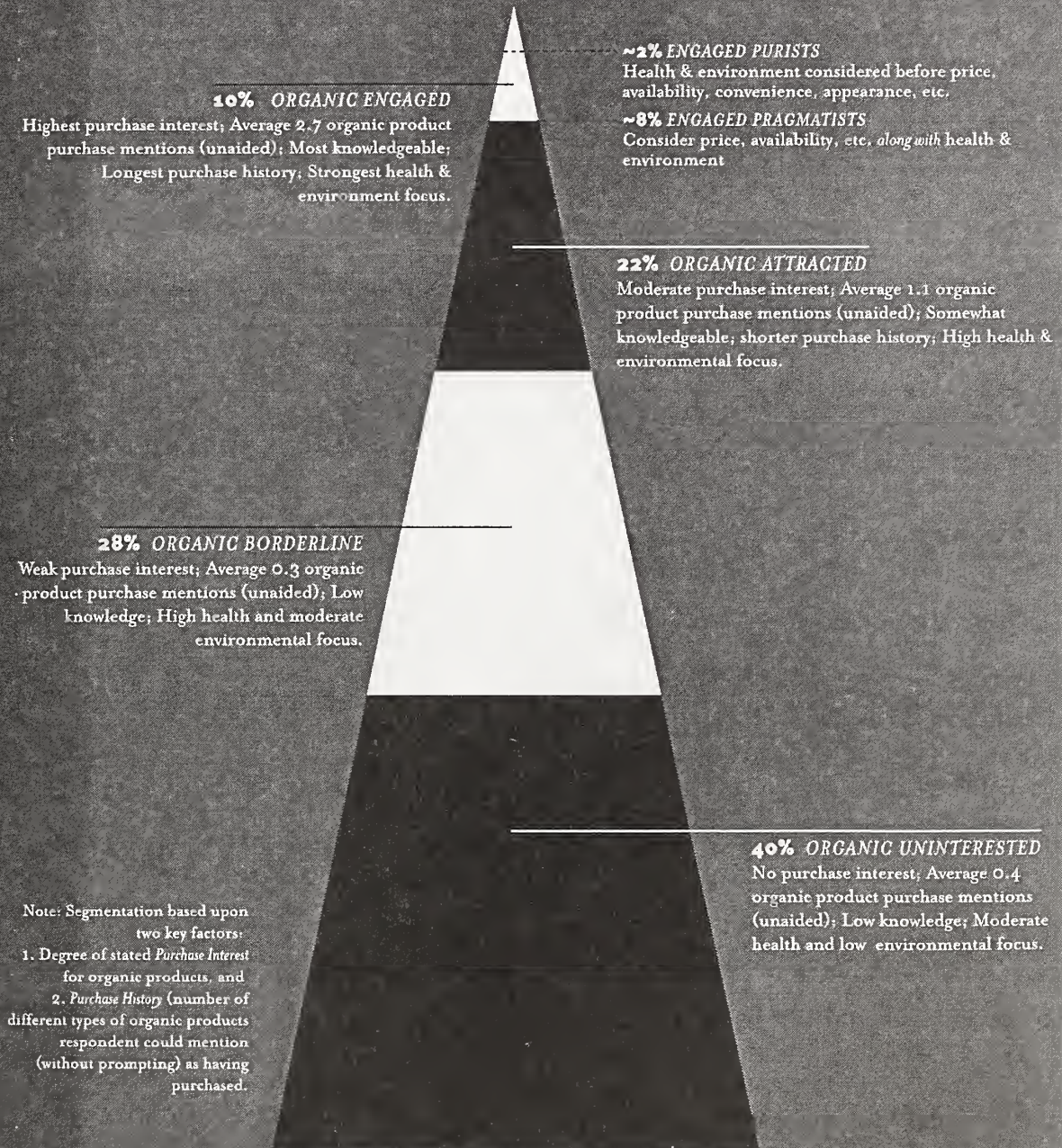
riers to increased organic product purchases. These segments and their sizes are summarized in Chart 4.1.

Overall, organic marketers should first focus on the 10% of the U.S. population comprised of Organic Engaged consumers. Among these, the Engaged Pragmatist sub segment is the cornerstone to growing the organic industry. Though these consumers would be served by deepening their awareness of organics, they are basically waiting for the pragmatic barriers of availability and price to drop in order to greatly expand their purchases. Of course, increasing perceived value-added benefits in organic products for this segment is an alternative to dealing with price barriers. This subsegment is expected to grow substantially in size over the next few years as more products meeting its pragmatic criteria are brought to market. The Organic Attracted, at 22% of U.S. consumers, is another ready market for *competitive* organic products. Much awareness-raising is required to tap this vast market. We recommend that the segments beyond the Organic Engaged and Attracted segments should not be currently targeted. The awareness of organic products for those "beyond" will naturally grow as they are exposed to messages intended for the Organic Engaged and Attracted segments. We predict that the millions among them who care strongly about their health or the environment will slowly diffuse into more organically oriented consumers.

Systematic analysis of the Hartman & New Hope Organic Survey revealed a very consistent continuum whereby the Organic Engaged ranked first and Organic Uninterested ranked last in terms of the following factors:

- Their knowledge about organic products
- The strictness of the standards they apply in their definition of "organic"
- Their likelihood to shop in health or natural foods stores

chart 4.1
THE HARTMAN & NEW HOPE ORGANIC CONSUMER SEGMENTS
Percentage of U.S. Population



- The length of time they have been purchasing organic products
- The relative importance of health and the environment versus price and availability as core purchase criteria for organic products
- Increased tolerance for price premiums coupled with the likelihood to buy even more products if prices are competitive
- Their awareness level of the health and environmental benefits of organic products

INDUSTRY TRENDS

Hartman & New Hope, through extensive secondary research and interviews with top industry leaders, identified 15 major trends that are working to shape a radically changed organic industry. In the text of this report we describe in detail the development of these trends and their dozens of important implications for the industry. For the purposes of the Executive Summary, we list them in Table 1.

The complex combination of these trends has created an industry in which growing competence in organic growing and processing methods have allowed more refined competitive differentiations to emerge. Today, product proliferation, expanding availability in mainstream retail channels, and the entry of sophisticated, well-funded corporations and individuals into the natural products market is setting the stage for vast industry changes. In the meantime, more and more organic products are gradually being adopted for use by a widening base of consumers.

STRATEGIC ISSUES

Developments among organic consumer segments and the dynamics of industry trends are expected to both open opportunities and raise new threats to companies selling in the organic market. While lowered barriers of awareness, availability, and price propel more consumers into the active organic market, chal-

lenges will arise as to how to target more finely delineated consumer segments. Simultaneously, organic businesses will need to:

- Keep marketing messages simple and effective
- Align skills and weaknesses with chosen markets and tactics, and
- Effectively manage retailers and profit margins

The organic market shows all the signs of shifting into a mass-market. Key success factors will revolve around:

- The ability of organic and natural products companies to envision their place in the current and future market
- Their perseverance through tumultuous changes
- Their ability to continually innovate so as to perfect product and marketing strategies
- Their willingness and ability to commit sizable financial resources to developing the market, and
- Their capacity to leverage other competitive strengths such as brand awareness, retail relationships, and information management skills

All in all, we expect the entire "gameboard" and many of the "rules of engagement" to shift within the organic industry, such that a new competitive basis for success will emerge. Whereas the old competitive basis emphasized basic resourcefulness, agricultural competence, standards development, personal sales, small enterprise management skills, and a great deal of perseverance, the new basis will add several fundamentally different factors, including:

- Market knowledge and effective consumer segment targeting
- Designing products, packaging, communi-

cations, and promotions that specifically cater to the felt needs of one's targeted customer base

- Choosing channels based on target customer preferences
- Learning to service the particular needs of one's chosen channel, and maximizing opportunities for promoting products within that channel
- The increasing use of public relations and

advertising to create consumer "pull" for one's products

- The continued proliferation of new organic products, but with increasing focus on the specific needs of one's targeted consumers
- Supply and delivery consistency
- General price competitiveness within a broad range, whether through cost reductions, or developing additional value-added benefits; and

table 1

KEY TRENDS REVOLUTIONIZING THE ORGANIC PRODUCTS INDUSTRY

Changes in the Public

1. **Evolving Cultural Values** emphasizing health, nature, community, spirituality.
2. **Demographic Changes** involving aging baby boomers with more children.
3. **Growing Awareness** about health, the environment, and even organic issues.

Changes in Organic Products

4. **Better Quality Products** in terms of taste, appearance, packaging, convenience.
5. **Reduced Price Premiums** due to better production methods and economies of scale.
6. **Ever-Increasing Product Offerings** within existing categories and new categories.
7. **Growth of "suborganic" Natural Products** with health and "eco" improvements.

Changes in the Conventional Food Industry

8. **Conventional Retailing** with consolidation, automation, category management, etc.
9. **Conventional Production** with farm buyouts, corporate expansion, biotech, etc.
10. **Conventional Food Distribution** with consolidation, third-party warehousing, etc.

Changes in the Organic Industry

11. **Expanded Retail Availability** in natural foods and conventional supermarkets, etc.
12. **Mergers, Acquisitions, Joint Ventures, and Outside Investor Interest** among organic retailers and producers.
13. **Entry by Mainstream Food Companies** via acquisition or new product development.
14. **National Certification Standard** to regulate organic claims and verification.
15. **Growing "Professionalization" and Competitive Sophistication** among companies

- Brand management, including image development, product focus, advertising and public relations, channel support, etc.

Overall, the number of options, permutations, and subtle distinctions available in the tactical portfolio of every company will expand greatly. In the body of this report, we conclude the strategy section by presenting a hypothetical case example in which two very different companies — a veteran organic market pioneer and a large mainstream food company — use their awareness of the industry's new competitive basis to craft very different but equally successful strategies to achieve a sustainable market position. The case example illustrates how companies can apply the insights revealed in this report to the everyday tasks of building their companies and caring for their customers.

CONCLUSION

The organic market is exploding with growth at a time when the fundamental competitive structure of the industry is evolving from entrepreneur-led businesses into a mass-market with large, medium, and small companies contending for both existing customers and entirely new emerging consumer market segments. In this time of flux, the competitive decisions made by companies based on their understanding of organic consumers and industry dynamics will determine whether they are numbered among either the future leaders or losers in the tempestuous times that lie ahead for the organic arena. The market requires that new, more differentiated strategies and decisions be made now with long-term commitment. As the competitive landscape begins to be reconfigured, companies today enjoy a unique opportunity to consciously analyze, plan, and work toward securing a sustainable position in the future organic world. Competition has certainly diversified and intensified, but for the moment the most powerful potential competitors — the mainstream food companies — are holding back. A historic

window presents itself in which companies today can pro-actively create their future, or they can remain focused on foreshortened concerns and respond to the buffeting of the marketplace. An expanded and deepened perspective is required to instill both the visionary foresight and the day-to-day clarity needed to avoid threats and recognize opportunities as they arise. The depth of research, analysis, and strategy in *The Evolving Organic Marketplace* supplies a penetrating perspective on the complexly evolving organic arena — giving those looking to the future in the market the tools to achieve significant success.

GROWING WITH CONSERVATION

David Stawick
President, National Conservation Buffer Council

The topic of my discussion, "growing with conservation," might once have been seen by some within agriculture as an oxymoron. As recently as the mid-1980s such an assessment was somewhat apt. In essence, this subject leads one to raise a question: "Can we grow with conservation?" In my opinion, this may be the most important question our industry will face in the new millennium.

Demand, Environment To Pose Challenges

That U.S. agriculture will endeavor to be a high-intensity, high-output industry in the future is a given. Our nation's farmers and ranchers face increasing demand for the food, fiber and fuel that are derived from the raw agricultural products they produce. We are all aware of the projections for growth both in worldwide population and in per capita purchasing power. Striving to meet the demand from this population boom will be an economic imperative for American agriculture producers. Some in our nation will doubtless see it as a moral imperative as well.

In fact, the U.S. is very well positioned to accept this challenge. Our climate, soils, infrastructure and technology are unparalleled. But aggressive use of land resources and other inputs will be necessary for farmers and ranchers to maximize production.

Because of the stimulus to achieve more and more output, environmental pressures on American farmers and ranchers will likely continue to be significant. Today's list of specific policy challenges is daunting. Agriculture is, indeed, "in the crosshairs" regarding many environmental issues, with water quality of foremost concern. Development of "total maximum daily load" (TMDL) allocations for pollutants and the pressures of nutrient-induced hypoxia in the Gulf of Mexico are among the most conspicuous policy issues. Within the rubric of air quality, agriculture also faces major ramifications from the recent debate over global climate change and the new air quality rules for ozone and particulate matter.

And while agriculture has traditionally had substantial support from Congress, that support may be tempered in the future or may, in some cases, be irrelevant. For example, mixed constituencies will cause Members of Congress to listen when city dwellers complain about higher bills for the removal of agricultural contaminants from drinking water. And some issues, like TMDLs, are impelled by court action.

There will be environmental benefits to agricultural production in the U.S., to be sure. Ethanol produced from corn and other cellulosic material burns cleaner than fossil fuels and may, at some point, become economically competitive with gasoline. Growing plant material can act as a repository for atmospheric carbon. And to the extent that production in our country replaces the breaking of new, fragile lands such as rain forests in South America, it will preserve valuable carbon sinks. But in the net, the pressures on the environment from agriculture will still outweigh

its direct benefits.

So we return to the question I posed at the outset about whether we can “grow with conservation” (perhaps better put, “Can we increase production while vigorously protecting resources?”). The answer is simple -- we have no choice. We must do so.

Policy Implications of the Dual Challenge

As American society strives to meet this dual challenge, what are the policy implications for the agricultural sector? One thing that seems inescapable to me is that the days that farmers and ranchers, and the organizations that represent them, can simply “hunker down” and ride out environmental policy challenges are over.

I would argue that, in fact, agriculture is no longer simply trying to lie low. Several commodity groups have developed stewardship programs or best management practice documents. The National Pork Producers Council participated in a provocative dialogue on environmental issues. And state-level organizations are getting increasingly involved in environmental matters. Consider a recent discussion I had with a friend who runs a state commodity association, in which he said he was considering hiring a full-time environmental staff person who would, among other things, solicit and oversee projects funded under section 319 of the Clean Water Act.

Of course, I feel that the National Conservation Buffer Council is also a cutting-edge example of the agriculture industry’s increasing sensitivity to environmental issues. The seven agribusiness firms that fund the Council certainly have an enlightened self-interest in seeing that farmers and ranchers are not shackled by environmental regulations in the years to come. But they also recognize that it is only through the widespread adoption of conservation practices such as buffers and attendant improvements in water quality that burdensome new regulations will be avoided.

1996 Farm Bill Provides New Tools

Just as agriculture has become more attuned to environmental issues, our nation’s farm policy has taken a major turn for the better. The 1996 farm bill eliminated annual acreage set-asides and the base acreage concept, allowing farmers the flexibility to make economically and environmentally rational cropping decisions. The conservation title of the bill established the new Environmental Quality Incentives Program, which provides \$200 million annually to promote conservation practices. EQIP signals a change in emphasis away from large-scale land idling as our main conservation practice. Instead, EQIP focuses on wise environmental management compatible with the level of production that the demographic trends I mentioned earlier will dictate.

The Clinton Administration’s operation of the Conservation Reserve Program has also been far-sighted since Congress reauthorized the program in the 1996 Farm Bill. The average environmental benefits of contracts let in the last two enrollment periods has jumped substantially. Particularly important to us at the National Conservation Buffer Council has been the continuous CRP signup for valuable buffer practices. The continuous signup is the most financially attractive incentive that will help us achieve Secretary Glickman’s goal of the establishment of two million miles of buffers by 2002. I am pleased to note that more than half a million acres of buffers had been created through the CRP as of last December, and the Secretary has pledged to hold back 5.5 million acres for the continuous signup.

The fact is that these policies are allowing us to “grow with conservation” today and they leave our nation well-positioned to continue to do so in the near future.

At this juncture, one is tempted to ponder what policies might one day be adopted to continue this environmental trend in the years to come. Bill Northey, who is a member of the Commission on 21st Century Production Agriculture, will presumably tackle that question in his presentation. But the question is so interesting I cannot pass up taking a small swing at it myself.

Stipulations for Future Debate

Let me begin by suggesting a couple of framework stipulations that, given my experience in the private sector and having worked for Congress, must be made by all participants in the debate if rational policy choices are to be arrived at in the future.

First, with respect to row-crop production and associated nonpoint source water pollution, there must be an appreciation by policy makers of the peculiarities of agriculture. These include the impacts of weather events, the difficulty of individual producers in a static situation to pass along the costs of environmental compliance, and the economic impetus for all farmers to maximize profit. These points argue for a management framework different than that for point sources, preferably one with economic incentives like those in the farm bill and in the President’s fiscal 1999 budget.

At the same time, there is compelling evidence that nonpoint source pollution is our nation’s major remaining water quality challenge and that agriculture is, collectively, among the most significant of the nonpoint sources. While we may quibble at the margins about the magnitude of culpability, the industry must appreciate that there is a factual basis for concern about our impact on water quality.

Second, regarding confined livestock operations, there must be a clear differentiation drawn between the potential these facilities have to pollute water resources and the impacts these large operations may have on the economic structure of the livestock industry. Too often, in my opinion, individuals and groups who are essentially against large farming operations for economic or sociological or political reasons are using environmental concerns as a stalking horse.

On the other hand, livestock operators must understand that a “we were here first” attitude will not pass muster with an increasingly urban public. Also, they must face up to the fact that large operations can have very serious detrimental environmental impacts in emergency situations. I like to say that animal agriculture is going through a growth phase somewhat analogous to the time of mechanization of row crop production. But recall that with the benefits of mechanization came new responsibilities, such as adhering to traffic laws while moving tractors and combines on rural highways. Animal agriculture must understand that its metamorphosis carries new responsibilities, also.

What farm policies for the future?

Much of the new policy that will affect agriculture will not be written in the agriculture committees of Congress, but by the other panels that have broader environmental jurisdiction. However, the agriculture committees will continue to have new opportunities to help farmers and

ranchers meet their environmental responsibilities. While the National Conservation Buffer Council has no formal positions on future farm policy, I have a few personal ideas on the form the future debate may take.

There is already speculation as to what, if anything, will succeed the “market transition” or “Freedom to Farm” contract payments as direct support payments to agricultural producers. While it is true that the contract payments decline over the seven-year life of the 1996 Farm Bill, the Congressional Budget Office will likely rule that some baseline expenditure level will continue to be available for a successor program. Let me suggest first that environmental linkages with any direct payments to producers that may be forthcoming will be seen by many as appropriate. Environmental groups that pushed for the wetland and highly erodible land conservation provisions of the 1985 farm bill will likely insist the provisions remain in place, although their case may be weakened somewhat by the lower level of individual payments and the existence of the wetland conservation program authorized by section 404 of the Clean Water Act.

One subject of speculation is the possibility that the farm program baseline may be used for an enhanced form of crop insurance or some other type of risk management protection in the next farm bill. If this is the case, Congress may want to consider environmental factors among those types of risk that could be addressed. For example, payments to producers could be made in the form of vouchers redeemable for crop or revenue insurance or for some type of enhanced environmental technical assistance. A secondary market could allow producers in low-risk areas to sell their vouchers to those in higher-risk regions or areas of greater environmental sensitivity.

A less cumbersome option could be a simple shift of some funds from the farm program payment account to the EQIP program. This would have the advantage of targeting EQIP priority areas, although the payments would not be “entitlements” in the form of the current market transition payments.

Conclusion

U.S. agricultural policy has made tremendous moves in recent years toward allowing greater production within a framework of greater environmental protection. Urban interests will likely push for a continuation of this trend and the agriculture industry will be wise to continue building on the environmental achievements of the past decade.

/Note: Opinions expressed in this paper are not necessarily those of the National Conservation Buffer Council or its sponsoring organizations.

Managing Global Change through Soil Conservation

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U.S. Agriculture

Agriculture is a major industry in the U.S.A. Farming contributes about 1% (>\$63 billion annually) to the national GDP and directly employs about 1.2% of the U.S. labor force (>1.6 million people). Farming plus agriculture-related industries contribute 13.5% (about \$1 trillion) to the national GDP and employ 17.3% (about 23 million people) of the U.S. labor force. The total land area of the U.S.A. is 7% of the world land area, but the cropland area is about 14% of the world's cropland area (Table 1). U.S. agriculture contributes 15% of cereals, 11% of wheat, 36% of corn, 22% of sorghum, 47% of soybeans, and 7% of peanut production in the world (Table 2). Cropland area in the U.S.A. is rapidly decreasing, due to conversion to other uses. The cropland area decreased from 188 million hectares (464 million acres) in 1987 to 158 million hectares (391 million acres) in 1993, a loss of 16% over the 6-year period (Table 3).

U.S. Agriculture and the Greenhouse Effect

Total U.S. emissions of greenhouse gases (GHGs) is estimated at 1666 million metric tons of carbon equivalent (MMTCE), of which agriculture contributes 80 MMTCE or 4.8% of the total (US-EPA, 1995). In comparison, DOE/EIA (1996) estimates total U.S. emissions of 1442 MMTCE, of which agriculture contributes 66 MMTCE or 4.6 of the total. Taking the average of both estimates, the mean emission of GHGs by agriculture is 73 MMTCE. Lal et al. (1998) estimated that agricultural emissions also should include an additional 15 MMTCE due to soil erosion and 27.9 MMTCE due to direct on-farm energy use and indirect fertilizer and pesticide production. Revised estimates by Lal et al. (1998) show that emissions of GHGs by U.S. agriculture contribute 116 MMTCE out of a total of 1597 MMTCE, or 7.3% of the total annual U.S. emissions (Table 4).

Sources Of Emissions Of GHGs From Agriculture

Principal sources of agricultural emissions of GHGs are: (i) mineralization of soil organic matter and emission of CO₂ due to plowing and other types of soil disturbance related to agricultural activities, (ii) CO₂ emission from soil erosion and erosion-induced soil degradation, (iii) natural levels of soil emissions of N₂O and NO_x and emissions from nitrogen fertilization, and (iv) CH₄ emissions from rice paddies, organic materials, and wetlands. Mineralization of soil organic matter due to plowing, accelerated soil erosion, and other soil degradative processes may have contributed a total or accumulative loss of 5000 MMTC from U.S. cropland (Lal et al., 1998)

Strategies Of C Sequestration in U.S. Cropland

Depending on the land use and soil/crop for sequestering C management systems, soil can be a source or a sink for atmospheric C. The principal strategy is to enhance and maintain high soil quality. The latter refers to soil productivity and its environmental regulatory capacity, and it strongly depends on soil organic matter content. The soil is an ultimate storehouse of C, and increase in soil C content improves soil quality. Soil C exists in various forms ranging from highly labile (with a short turnover time) in living organics (biomass carbon) to highly resistant humic substances with a very long turnover time. The highly resistant forms of C may be due to the complex nature of organic substances which are not easily decomposed by microorganisms or due to C entrapment within micro-aggregates, in the form of organomineral complexes, making it slowly accessible to organisms.

Soil degradation (e.g., erosion, salinization, compaction, contamination, pollution, acidification, soil fertility depletion) depletes soil organic matter content and accentuates emissions of GHGs. Soil degradation is exacerbated by excessive plowing, drainage of wetlands, poor water management, excessive and untimely vehicular traffic, and no-input or low-input techniques that lead to mining of soil nutrient and depletion of soil fertility. In contrast, soil restorative measures can increase biomass production, increase soil organic C content, improve soil quality, and partially mitigate the greenhouse effect.

Potential Of U.S. Cropland For C Sequestration

Principal strategies to sequester C in soil are: (i) convert marginal lands to compatible land use systems, (ii) restore degraded soils, and (iii) adopt best management practices of BMPs (Table 5). Taking agriculturally marginal land out of production and adopting an ecologically compatible land use system can lead to an increase in the total biomass production and an increase in C content in soil.

Government-sponsored programs on land conversion include CRP, WRP and Conservation Buffers, and all help to improve soil quality and enhance C sequestration in soil. Restoration of degraded soils is important not only to C sequestration but improving the overall environment. Among severely degraded lands in the U.S. are those caused by soil erosion, excessive salt buildup in the root zone, drastic disturbance by mining and other urban activities, and soil contamination by industrial pollution.

There have been numerous advances in agricultural technologies for sustainable management of soil and water resources. Important among these are: (i) conservation tillage, (ii) management of crop residue and other organic materials, (iii) soil fertility enhancement through site-specific management and nutrient recycling techniques, (iv) elimination of summer fallow, (v) use of winter cover crops, and (vi) other techniques that improve crop/biomass yield (e.g., IPM). The carbon sequestration potential of these practices in U.S. cropland is 125.6 MMTC/yr (Lal et al., 1998).

In addition to sequestering C in soil, the idle crop land can also produce biofuels. Adoption of conservation tillage saves fuel consumption, and there are numerous options to reduce emissions of CH₄ and N₂O from agricultural sources. The data in Table 6 show that the total C sequestration and fossil fuel off-set potential of U.S. cropland is 154 MMTC/yr or 133% of the total emissions of GHGs by agricultural activities. Therefore, rather than being a source, U.S. agriculture can be a sink for atmospheric C through adoption of appropriate land uses and BMPs.

C Sequestration In Soil: A Win-Win Strategy

Adoption of appropriate land uses and BMPs is a win-win strategy. It leads to: (i) C sequestration in soil and help mitigation of the greenhouse effect, (ii) improvement in soil quality and agronomic productivity, and (iii) enhancement of overall environmental quality. The SOC is a highly valued commodity. In terms of agricultural productivity alone, some agronomists estimate its value at \$0.20/kg (0.9¢/lb). If so, annual sequestration of 125.6 MMTC is equivalent to \$25 billion or equivalent to 40% of the total annual agricultural production. In addition to increasing soil productivity, C sequestration in soil can lead to improvements in environment e.g., decreasing the risks of siltation of waterways and reservoirs, decreasing CO₂ concentration in the atmosphere, and reducing the cost of environmental cleanup. Some economists estimate that reduction in C emissions would require a carbon tax ranging from \$200 to \$350 per MT of C (OECD, 1994). Assuming an average tax of \$300 per MT, a total saving of 154 MMTC/yr is equivalent to \$46 billion/year. Therefore, total saving by C sequestration in soil and fossil-fuel off-set by proper land use and soil management is about \$71 billion/year or \$260 per capita per year.

Conclusion

Agriculture often has been blamed for environmental problems ranging from soil erosion and degradation to eutrophication of surface water and contamination of ground water, loss of biodiversity, and the greenhouse effect. Rather than being a problem, adoption of appropriate land use and BMPs is an important solution to numerous economic and environmental issues. Adoption of appropriate land use and BMPs on U.S. cropland is indeed a win-win situation.

It is in our national interest to encourage widespread adoption of proper agricultural practices for sustainable use of natural resources and improvement of our nation's environment. Adopted on a global scale, the C sequestration potential of restoration of degraded soils is about 3 Pg/yr. Although completely realizing this goal will be difficult, restoration of degraded soils should be an important global agenda.

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Table 1. Agricultural land area in the U.S.A. and the world (FAO, 1995).

Land use	World	USA	% of the world
	-----million hectares-----		
Total area	13382	936	7
Land area	13045	916	7
Arable land	1345	186	14
Permanent crops	106	2	2
Permanent pastures	3395	239	7
Forest and woodland	4138	296	7
Other land	4061	193	5

Table 2. Agricultural production in the world and in the U.S.A. (FAO, 1995).

Production	World	USA	% of the world
	----million metric tons/yr---		
Cereals	1896	277	15
Wheat	541	59	11
Corn	515	187	36
Sorghum	54	12	22
Soybeans	126	59	47
Peanuts	28	2	7

Table 3. Major uses of cropland in the U.S.A. (USDA-ERS, 1994).

Land use	1987	1993
	-----million hectares-----	
Cropland	188	158
Cropland used for crops	134	134
Cropland idled	28	24
Cropland used for pastures	26	---

Table 4. Contributions of U.S. agriculture to total emissions of greenhouse gases (US-EPA, 1995; DOE/EIA, 1996; Lal et al., 1998).

Source	US-EPA (1995)	DOE/EIA (1996)	Lal et al. (1998)
Total emissions	1666	1442	1597
Agricultural emissions	80	66	116
% of total	4.8	4.6	7.3

Table 5. Strategies of C sequestration in the U.S. cropland.

Strategies	Techniques
1. Conversion of marginal lands	(i) CRP, (ii) WRP, (iii) Conservation Buffers
2. Restoration of degraded soils	(i) Eroded soils, (ii) mineland soils, (iii) salt affected soils, (iv) soil contamination
3. Best Management Practices (BMPs)	(i) Conservation tillage and residue management, (ii) water management, (iii) fertilizer and organic manures, (iv) rotation and winter cover crops, (v) summer fallow elimination

Table 6. Potential of U.S. cropland for greenhouse effect mitigation (Lal et al., 1998).

Strategy	Potential (MMTC/yr)	% of total annual emissions of GHGs (116 MMT/yr)
1. C sequestration in soil	126	108
2. Fossil fuel off-set	12	11
3. Saving fossil fuel	1	1
4. Reduction in C emission by soil erosion	15	13

HYPOXIA: A GLOBAL PERSPECTIVE

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A review of literature pertaining to ecological effects of hypoxia and anoxia revealed that the oxygen budgets for major coastal ecosystems around the world have been adversely affected mainly through the process of eutrophication, which acts as an accelerant or enhancing factor to the development of hypoxia and anoxia. All of these ecosystems have reported some type of monotonic decline in dissolved oxygen levels through time. In many of these systems there is a strong correlation between human activities and declining dissolved oxygen (for example: Gulf of Mexico, TX-LA; Northern Adriatic Sea, Italy-Croatia; Kattegat, Sweden-Denmark). In others the linkage of human activity to hypoxia are less obvious (for example: Chesapeake Bay, MD-VA; Saanich Inlet, British Columbia; Port Hacking, Australia). Many ecosystems now severely stressed by hypoxia appear to be near or at a threshold of imminent collapse (loss of fisheries, loss of biodiversity, alteration of food webs). The northern Gulf of Mexico may be typical of these severely stressed ecosystems that are on the edge, currently burdened with severe annual hypoxia. Over the last several decades this hypoxia, popularly known as the "dead zone", has become a dominant forcing function in the northern Gulf of Mexico controlling the population dynamics of both benthic and pelagic species, and is also implicated as an agent in the decline of fisheries stocks. The Black Sea is typical of ecosystems that have experienced hypoxia related collapsed fisheries. Since the 1960's increasing hypoxia and anoxia have been blamed for the replacement of the highly valued demersal fish species with less desirable planktic omnivores. Of the 26 commercial species fished in the 1960's only 6 still support a fishery.

It is clear that no other environmental variable of such ecological importance to estuarine and coastal marine ecosystems around the world has changed so drastically, in such a short period of time, as dissolved oxygen. While hypoxic and anoxic environments have existed through geological time, their occurrence in estuarine and coastal areas clearly are rapidly increasing, most likely accelerated by human activities.

The importance of oxygen as an ecological factor for maintaining populations, of fisheries related species, can not be over emphasized. The seriousness of hypoxia and anoxia as environmental issues that must be effectively dealt now is best expressed by the motto of the American Lung Association: "If you can not breathe, nothing else matters."

Hypoxia - what is it?

Oxygen is necessary to sustain the life of all fishes and invertebrates. In aquatic environments, oxygen from air dissolves into water and supplies the respiration needs of all animals, including those that swim or move about the bottom and those that have a sedentary life. Once dissolved

into surface waters, the normal condition is for dissolved oxygen to be mixed down into bottom waters. When the supply of oxygen to the bottom is cut off or the consumption rate exceeds resupply, oxygen concentrations become too low to sustain animal life. This condition of low dissolved oxygen is known as hypoxia. The point at which various animals suffocate varies but generally effects start to appear when oxygen drops below 2 ml O₂/l, for sea water this is only about 25% of what it should be. As a point of reference, air is about 200 ml O₂/l. Anoxia is the complete absence of oxygen. The two principal factors that lead to the development of hypoxia, sometimes leading to anoxia, are water column stratification that isolates the bottom water from exchange with oxygen rich surface water and decomposition organic matter in the bottom water that reduces oxygen levels.

The link to nutrients and eutrophication

The increasing input of anthropogenic nutrients to many coastal areas over the last several decades has been suggested as the main contributor to more recently declining trends in bottom water oxygen concentrations around the world. Many studies have demonstrated a correlation through time between population growth, increased nutrient discharges, increased primary production in coastal areas, and finally, increased occurrence of hypoxia and anoxia. The Gulf of Trieste, Northern Adriatic Sea, is a good example of this connection. Oxygen measurements from early in this century indicated that oxygen concentrations in bottom waters were always high. The current state of severe annual hypoxia in this region has been reached gradually over a period of about 25 years as a direct result of increased sedimentation of organic matter from phytoplankton blooms fueled by excess nutrients coming out of the Po River, Italy.

The global picture

Up to the 1950's, reports of mass mortality of marine animals caused by lack of oxygen were limited to systems that already had histories of oxygen stress, such as Mobil Bay, AL. Starting in the 1960's the number of systems reporting hypoxia related problems increased. A summary of coastal bays and seas that are experiencing excess nutrient related hypoxia is presented in Table I. Details of events that lead to development of hypoxia in these systems will be discussed in the presentation.

Conclusions

Oxygen deficiency (hypoxia and anoxia) may very well be the most wide-spread anthropogenically induced deleterious effect in estuarine and marine environments around the world that causes mortality of bottom dwelling fauna, including fisheries species. Over the last 15 to 20 years the number of coastal areas with seasonal hypoxia in the bottom water is spreading rapidly and the main cause for this is suggested to be delivery of excess nutrient to the system, eutrophication. A future global warming may accelerate these effects and enlarge the areas that are affected.

TABLE I

Summary of benthic effects for hypoxic systems around the world. Several of these systems also experience anoxia. In the case of many fjords there is an anoxic zone within which no macrofauna occur. The absence of fauna from these anoxic zones is not considered a community response but a consequence of stable anoxia. Hypoxia is typed as: Aperiodic, events that are known to occur at irregular intervals greater than a year; Periodic, events occurring at regular intervals shorter than a year; Seasonal, yearly events related to summer or autumnal stratification; Persistent, year round hypoxia. Levels of hypoxia are: Moderate, oxygen decline to about 0.5 ml/l; Severe, decline to near anoxic levels, could also become anoxic. Time trends of hypoxia, area and or intensity, for the systems are: - = Improving conditions; + = Gradually increasing; ++ = Rapidly increasing; 0 = Stable; . = No temporal data. Benthic community response is categorized as: None, communities appear similar before and after hypoxic event; Mortality, moderate reductions of populations, many species survive; Mass Mort., drastic reduction or elimination of the benthos. Benthic recovery is: No Change, dynamics appear unrelated to hypoxia; Some, recolonization occurs but community does not return to prehypoxic structure; Slow, gradual return of community structure taking more than a year; Annual, recolonization and return of community structure within a year.

System	Hypoxia Type	Hypoxia Level	Time Trends	Fauna Response	Fauna Recovery	Fisheries Response
New York Bight, New Jersey	Aperiodic	Severe	.	Mass Mort.	Slow	Surf Clam losses
Shallow Texas Shelf	Aperiodic	Severe	+	Mass Mort.	Slow	Stressed
Deep Texas Shelf	Aperiodic	Moderate	0?	Mortality	Annual	Stressed
German Bight, North Sea	Aperiodic	Mod./Severe	+	Mass Mort.	Annual	.
Somnone Bay, France	Aperiodic	Severe	+?	Mass Mort.	Slow	Collapse of Cockle fishery
North Sea, W. Denmark	Aperiodic	Severe	+	Mortality	Annual	Stressed
New Zealand	Aperiodic	Severe	.	Mass Mort.	.	Stressed
York River, Virginia	Periodic	Mod./Severe	0	None	No Change	Stressed
Rappahannock River, Virginia	Periodic	Severe	+	Mortality	Annual	Stressed
Long Island Sound, New York	Seasonal	Severe	+	?	?	Lobsters displaced
Main Chesapeake Bay, Maryland	Seasonal	Severe	+	Mortality	Annual	Stressed
Pamlico River, North Carolina	Seasonal	Severe	.	Mass Mort.	Annual	.
Mobile Bay, Alabama	Seasonal	Severe	0	Mass Mort.	?	Stressed
Hillsborough Bay, Florida	Seasonal	Severe	.	Mass Mort.	Annual	.
Perdido Bay, Florida	Seasonal	Severe	.	Mass Mort.	Annual	.
Louisiana Shelf	Seasonal	Mod./Severe	+	Mortality	Annual	Stressed
Saanich Inlet, British Columbia	Seasonal	Mod./Severe	0	Mortality	Annual	.
Bornholm Basin, S. Baltic	Seasonal	Mod./Severe	+*	Mass Mort.	Slow	.
Kiel Bay, Germany	Seasonal	Severe	+	Mass Mort.	Annual	Stressed
German Bight, North Sea	Seasonal	Severe	+?	Mortality	Annual	Stressed
Lough Ine, Scotland	Seasonal	Severe	0	Mass Mort.	Annual	.
Århus Bay, Denmark	Seasonal	Severe	+	Mass Mort.	Slow	.
Limfjord, Denmark	Seasonal	Severe	+	Mass Mort.	Annual	None
Kattegat, Sweden-Denmark	Seasonal	Mod./Severe	++	Mass Mort.	Slow	Collapse Norway Lobster
Laholm Bay, Sweden	Seasonal	Severe	++	Mortality	Annual	Stressed
Gullmarsfjord, Sweden	Seasonal	Severe	+	Mass Mort.	Annual	Stressed
Swedish West Coast Fjords	Seasonal	Severe	++	Mortality	Some	Stressed
Oslofjord, Norway	Seasonal	Mod./Severe	+	Mortality	Annual	Reduced
Gulf of Trieste, Adriatic	Seasonal	Severe	++	Mass Mort.	Slow	Stressed
Elefsis Bay, Aegean Sea	Seasonal	Severe	.	Mass Mort.	Annual	.
Black Sea NW Shelf	Seasonal	Severe	++	Mass Mort.	Annual	Reduced
Port Hacking, Australia	Seasonal	Severe	.	Mortality	Annual	.
Tolo Harbor, Hong Kong	Seasonal	Severe	.	Mass Mort.	Annual	.
Seto Inland Sea, Japan	Seasonal	Moderate	.	Mortality	Annual	.
Tome Cove, Japan	Seasonal	Severe	.	Mortality	Annual	.
Japan, All Major Harbors	Seasonal	Severe	++	Mass Mort.	?	Reduced
Yellow Sea, China	Seasonal	Severe	?	?	?	.
Aegean Sea	Seasonal	Severe	?	?	?	.
Sea of Azov	Seasonal	Severe	+	Mass Mort.	?	Reduced
Loch Creran, Scotland	Persistent	Severe	0	Mass Mort.	No Change	.
Byfjord, Sweden	Persistent	Severe	0	Mortality	Some	Pelagic only
Idelfjord, Sweden-Norway	Persistent	Severe	+#	Mortality	Some	.
Baltic Sea, Central	Persistent	Severe	++	Mortality	Some	Stressed
Gulf of Finland, Deep	Persistent	Mod./Severe	-	Reduced	Slow	.
Black Sea (except NW shelf)	Persistent	Severe	+	No Benthos	No Change	Pelagic only
Caspian Sea	Persistent	Mod./Severe	0	Mortality	Some?	.
Fosa de Cariaco, Venezuela	Persistent	Severe	.	Reduced	No Change	.

* These systems are currently in a persistent hypoxic state.

Recent improvements in oxygen concentrations due to pollution abatement.

American Farmers: Their Stake in Asia, Their Stake in the IMF

Deputy Treasury Secretary Lawrence H. Summers

Thank you. I am glad to have this opportunity to discuss recent developments in Asia and the United States response to those events.

There is little need to remind this audience that Asia matters. There is little need to remind you that resolving the financial crises in the region is about protecting core American interests--protecting American wages, American savings and American security. No one can be certain what the precise impact of these events will be. But one thing is clear: American farmers and ranchers will be among the first to feel the effects. And they will be among the first to suffer from a failure to restore financial stability as soon as possible.

I'd like to discuss three topics this evening:

- the crises in Asia and risks they pose to the United States--the agricultural sector, in particular;
- the United States response to these crises and key role of the International Monetary Fund;
- the urgent need to offer continued support for the IMF in the context of these efforts.

I. The Crises in Asia and the Risks to American Agriculture

These crises come at a special time for the United States--a time of rapid, sustained growth, a time of low inflation, a time of historic increases in employment. We have a responsibility to do all we can to protect this strong performance. In an interconnected world, that means protecting our growing stake in a stable and prosperous global economy.

Our exporters, with agriculture, as always, at the forefront, have played a major role in our recent economic success. Financial instability, economic distress, and depreciating currencies all have direct effects on these highly integrated sectors: on the pace of our exports, the competitiveness of our companies, the growth of our economy and the well-being of our workers:

- In the past four years, nearly one-third of our economic growth has been due to exports--exports which now support more than 11 million jobs, and pay, on average, 15 percent more than jobs in non-trade-related sectors. And some 45 percent of the recent growth in our exports has been in Asia.

- Asia is the largest market for agricultural exports, and has been growing at the second fastest rate. Fully 45 percent--\$28 billion--of United States farm exports go to the region. The South-East Asian economies and Korea, the countries worst affected by the crises to date, account for 12 percent of all American agricultural exports.

As early as last December USDA was estimating that the crises in Asia would cut United States exports by \$500 million this year. Without the multilateral assistance package assembled by the IMF, USDA now believes the crises might have reduced United States exports worldwide by 3 to 6 percent over the next two years relative to what would have been. For this fiscal year, the loss in exports would have been \$2 billion, with sales in Southeast Asia and Korea alone falling \$1.25 billion.

None of these very imprecise estimates take account of the further knock-on effects if the crises were further prolonged, or spread to emerging markets in other regions--leading to a cycle of costly devaluations and impeding open trade.

And, of course, it would not only be trade that was affected. A long drawn-out crisis:

- could also affect our financial markets, and with it everything from investment in tools and equipment for workers to mortgages for new homes;
- It could raise serious concerns for national security, given the proven potential for financial crises to trigger broader conflicts. We have 100,000 troops in Asia, 37,000 on the Korean peninsula alone, where North and South Korea have only just begun negotiating a possible end to their conflict.

To repeat, any forecast of the impact of these crises--like the situation in Asia--is highly uncertain. A great deal will depend on the success of United States-led efforts to restore stability and growth in the region and to limit the impact on our economy.

II. The United States Response

We have taken direct action through USDA's Commodity Credit Corporation to lessen the effects of the crises on US farmers and ranchers by making available \$2.1 billion in export credit guarantees to Korea and other Asian countries. GSM is working. American exporters have already sold over \$362 million worth of beef, cattle hides and skins, cotton, pork, soybean meal, and wheat since the package was announced in early January.

A similar effort is underway to support our capital goods exports. Last Friday, in London, Ex-Im Bank organized a multilateral export credit agency (ECA) initiative to keep trade finance flowing to Asian countries undertaking reform programs. In conjunction with the pursuit of policies that maintain creditworthiness, Ex-Im Bank announced that it is prepared to provide short-term trade

insurance of up to \$1 billion each to Indonesia, Korea and Thailand--a major increase from Ex-Im Bank's pre-crisis level of \$62 million.

Providing this support is truly a win-win proposition for the United States: It gives immediate protection to American exports and jobs, while at the same time speeding the long-term recovery of these important markets.

In the midst of the crises, all of these efforts will help to keep trade flowing and markets open. But there is a limit to what they can achieve while the fires of financial instability are still burning. The overriding imperative must be to restore stability and growth so that these countries will once again be strong markets for American goods, and will enjoy the economic conditions conducive to political and social stability. To support that objective we have:

- given strong United States support to tough IMF-led reform programs in Thailand, Indonesia and Korea to restore market confidence and lay a surer foundation for growth;
- where these reforms are to be carried out, supported the provision of temporary, conditioned, international assistance, centered around the IMF, to give countries the financial breathing space to put their economies back on track;
- encouraged strong action by other economies in the region--especially Japan and China--to promote their collective interest in long-term financial stability and growth;
- stepped-up US-led efforts to strengthen the international financial system to safeguard against these kinds of crises and respond to them effectively when they do take place.

Let me say a little about the content of the reform programs we have supported in Asia and the implications for United States trade.

While each program is tailored to address the specific causes of that country's crisis, the focus throughout has been on making the economy more market-oriented and better able to allocate capital and to allow market forces to operate. Important, long overdue changes will need to occur in the structure of these economies--changes which have been welcomed, in many cases, by officials in the countries themselves.

The upshot is that these programs will serve a dual purpose for United States exporters and farmers. Not only will they help stabilize the situation in the short-term and support our existing markets in Asia; they will also help open up many new markets and opportunities for United States companies and United States farmers. Specifically:

- Indonesia's stabilization package commits the government to eliminating a range of officially-sanctioned import and export monopolies, removing export taxes on resource products, reforming the government procurement process, and accelerating the pace of privatization. Tariffs on food imports have been cut to a maximum of 5 percent, effective immediately.
- And in Korea, the government will streamline its cumbersome import clearance

procedures on products such as corn grits, soyflakes, and peanuts; it will eliminate trade-related subsidies, reducing high price supports for rice and beef and reducing the number of agricultural products subject to tariff rate quotas and noneconomic directed lending to industry will come to an end.

In some ways the IMF has done more in these past few months to liberalize these economies and open their markets to United States goods and services than has been achieved in rounds of trade negotiations in the region. And it has done so in a way that serves our critical, short and longer term interest in the restoration of confidence and growth in this vital part of our world.

III. The Need to Support the IMF

Everyone here understands the critical role for short-term international support at times of financial crises -- support that can put a floor to a plummeting exchange rate, a declining economy, and a shrinking capacity to buy imports.

The international community will not help countries who are not committed to helping themselves. But without short-term outside support, even those countries that are pledged to the right reform policies might face default--either at a government level or by the financial system as a whole--which could have devastating effects on their own economies and significantly raise the risks of contagion in other markets.

This is not just an hypothesis. The world has had ample experience with international financial problems that do not meet with a cooperative response. A recent Washington Post column talked about what was for 50 years called America's Great Depression: the events that began in the 1870s, which hit our farmers worst of all. And of course, an even clearer example of what happened when the United States was not prepared to lead with respect to international financial problems was provided by events in Europe in the early 1930s, when devaluation--competitive devaluation--deflation, contraction, and widespread depression laid the ground for what was as great a conflict as human history has seen.

The United States has an immense interest in helping stop these vicious chain reactions in their tracks. And in the IMF we have the most effective way for us to provide that help. That is why the United States needs urgently to follow through on its commitment to support the increase in IMF quotas that was agreed last year, and contribute to an important new emergency facility, the New Arrangements to Borrow, to supplement the IMF's resources in these types of situations.

Fifty years of bipartisan support for the IMF has not cost the American taxpayer one cent, because it has not had a major default, and because its lending is backed by very substantial gold reserves. The IMF presently has \$65 billion in loans outstanding--and \$40 billion in reserves.

It operates much like an international credit union. We and other countries provide a line of credit, and when the IMF draws on our commitments, we receive a liquid, interest-bearing offsetting claim on the IMF. That is why there are no direct budget costs. That is why our contribution does not increase the deficit, or impact other spending priorities.

The United States has been an active proponent of changes at the IMF to make it more effective in support of US interests. In the last three years we have worked to:

- adapt the IMF to a world that is much more dominated by capital accounts than any we've had before, and to one in which greater transparency of international financial and economic data is a critical bulwark against instability.
- ensure the IMF is keenly focused on its primary goal of promoting growth and prosperity for all in its member countries. By paying closer attention to the needs of the poor in designing adjustment programs and encouraging governments to cut unproductive expenditures, such as military spending.
- bring the same values that the IMF stresses to its clients--of transparency and accountability--to the IMF itself, with much wider publication of IMF internal data, and greater use of external evaluations.

These are a few examples of where progress is under way. There are other, larger questions that we will have to face in the months ahead as we learn and distill the lessons from the Asian crisis.

If we are to keep up with the dramatic pace of change in this new global economy, we can and must update and improve the IMF, just as we must work to improve the entire international financial architecture of which the IMF is a part. But we must do this in a way that supports rather than undermines the long-term international financial stability in which American workers, American farmers, and American companies have such an enormous stake.

Not to support the IMF at this critical time would be a little like canceling one's life insurance when one has already gotten sick. This is simply not a risk we should take. And it is not a risk the American taxpayer would want us to take--when we can invest in the protection of the IMF at zero cost to our budget.

At this critical time we have a responsibility to do all we can to protect America's core economic and security interest in an open and prosperous Asia. And that means protecting the IMF's capacity to respond, not just to today's challenges, but to the challenging new century to come.

Grains and Oilseeds Outlook for 1998 Acreage Shifts and Shifting Demand

Bradley Karmen
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Introduction

Each outlook conference generally focuses on "issues of the day," issues that create uncertainties in our forecasts. We may know some uncertainties, such as policy tools, when we develop the forecasts; sometimes we can anticipate these and make adjustments. We know other uncertainties are unpredictable, such as weather conditions or shocks overseas; we are forced to adjust to these shocks "after the fact."

Two years ago the biggest unknown concerned farm policy. In 1996, we assumed a continuation of the then-current farm legislation--acreage reduction programs, target prices, deficiency payments, and a smaller CRP program than today's levels. The 1996 farm bill was signed soon after that outlook conference ended, and farmers planted more acres than we anticipated for wheat and soybeans. Was this in response to the new legislation giving farmers the "freedom to farm?" Most likely not. Higher-than-expected prices at planting time encouraged farmers to plant more and poor weather conditions in several regions of the country prompted farmers to change their crop mix.

Last year, we forecast the farm policies correctly, not too difficult considering farmers had to enroll in 7-year contracts the year before. Congress didn't make any changes to farm programs either. And we even predicted the correct enrollment level for the Conservation Reserve Program; again, an easy task because new enrollments and withdrawals were relatively small that year. Last year was the first in a long time that we could not blame subsequent policy changes for the "errors" in our baseline projections.

So, does this mean we correctly forecast acreage planted in 1997? No. For example, we underestimated soybean acreage by more than 6 million acres. Was this increase in response to the new legislation, higher prices or weather conditions? It's likely a combination of all three, but it's difficult to rank the relative importance of each. I'll attempt to address the issues raised by this question throughout this discussion.

The main unknown in last year's outlook speech was how farmers would adjust their plantings in response to changes in prices. China, as usual, was also a critical issue. This year I would like to continue the dialogue on planting flexibility, but switch the focus from China to other Asian countries. Not that China has ceased to be of concern, but South Korea and Southeast Asia have moved to the forefront.

Before focusing on the 1998 projections, I will examine land use in the United States to see if our long-term productive capacity and export competitiveness may be constrained. Then, I will look at the Department's projections of planted acreage for wheat, corn and soybeans we issued the past two years and see if we can learn lessons from our forecast "errors."

Land Use, Idled Acres, and Exports

U.S. plantings of the principal crops in 1996 increased to the highest level since the mid-1980's--up about 16 million acres from 1995--and stayed at that level in 1997. Producers idled about 95 million acres of crop land the last 2 years--about 22 million acres in summer fallow, about 33 million acres idled in the Conservation Reserve Program, and an additional 40 million acres voluntarily idled by producers.

What changes in planted acreage and idled acreage can we expect for 1998? First, it is estimated that acreage in the Conservation Reserve Program will fall by about 2.3 million acres, freeing up that many acres to be planted in 1998. Despite the additional acres available for planting, we expect acreage planted to the major crops to fall slightly in 1998.

A few States will have fewer acres to plant because CRP participation increased in 1998, most notably about 525,000 acres in North Dakota. The biggest decline in CRP acreage is in Minnesota, falling by about 450,000 acres in 1998. From a regional perspective, only in the Northern Plains and Mountain States will CRP acreage be higher in 1998. The Corn Belt loses the most CRP acres, followed by the Lake States and the Southern Plains. The following table provides a regional comparison.

Change in CRP Enrollment: Crop Year 1997 to Crop Year 1998			
Region	Change in CRP acres	Region	Change in CRP acres
Corn Belt	- 606,000	Appalachian	-225,000
Lake States	- 553,000	Delta	- 47,000
Southern Plains	- 421,000	Northeast	- 12,000
Southeast	- 396,000	Mountain	+84,000
Pacific	- 352,000	Northern Plains	+188,000
U.S.	- 2,340,000		preliminary

By 2001, acreage in the CRP is expected to increase by 3.6 million acres from 1997 to the authorized level of 36.4 million and remain at that level through 2007. Planted acreage of major crops in 2007 is forecast to increase by about 10 million acres from 1997. If summer fallow acreage holds steady and if crop land acres in the United States continue to decline by 1 million acres per year, at least 15 million acres would still be voluntarily idled by producers in 2007.

The data suggests that there is additional land to plant to meet the expanding domestic and overseas markets.

Lessons Learned About Plantings and Regional Acreage Shifts

1996: The 16-million acre increase in plantings for 1996 primarily occurred for corn, wheat, sorghum and soybeans. Cotton, oats, and sunflower acreage declined. Producers reacted to both strong prices and weather-induced acreage shifts. Some producers substituted plantings of one crop for another crop; many others increased their overall acreage. Let's look at some examples:

- Producers in the Delta States doubled their corn plantings and cut back on their cotton acreage because price prospects for early harvested corn were excellent given the extremely low corn stocks at the end of the 1995/96 season.
- Corn Belt farmers increased corn, soybean, and wheat acreage; only oats acreage declined.
- Acreage of corn, soybeans, and wheat increased in the Northern Plain States while sunflower acreage declined there. Area planted to spring wheat (not including durum) was the largest since 1936 because of high prices and abundant moisture at planting time. The increase in spring wheat acreage by North Dakota farmers, the largest spring wheat State, was accomplished by planting less sunflowers and planting wheat on land that would normally have been summer fallowed.
- Sorghum acreage increased in Texas when producers replanted failed cotton acreage and acreage skyrocketed in Kansas when producers planted sorghum on abandoned winter wheat fields.

1997: U.S. plantings of principal crops in 1997 remained at 1996's level. Producers adjusted the mix of crops on their farms, but, on average, did not expand acreage as they did in 1996.

- The biggest acreage shifts in 1997--and the magnitude of the change caught everyone by surprise--was the 6.7-million-acre increase in soybean planted acreage. Soybean producers never had any acreage controls associated with their crop, but to the extent that acreage limitations for other crops limited the expansion of soybean acreage, the 1996 farm law could have been partially responsible for the acreage increase. Very strong oilseed prices, modifications of farm rotations to include more soybeans, favorable planting conditions for soybeans, and problems getting other crops planted also led to this soybean acreage surge. Record acreage of soybeans in the Lake States, Corn Belt and Northern Plains displaced corn and wheat plantings in this region.
- Plantings of sorghum declined in 1997 because the crop was not replanted after failed acres of other crops.

- Cotton acreage declined for the second consecutive year because a cool, wet spring limited plantings and more favorable net return prospects for several competing crops. Cotton acreage fell throughout the country, except for a small increase in the Southeast, as a recent buildup in the cotton infrastructure of the region has supported acreage there and some area planted to corn in 1996 returned to cotton.
- Winter wheat acreage dropped to the lowest level since 1978 and was considerably below market expectations. Again, much can be explained by prices and weather-related conditions. Most States that expanded their wheat acreage in 1996 in response to rising prices scaled back wheat plantings the following year. Also limiting winter wheat plantings were late soybean and sorghum harvesting in 1996, disease concerns in the eastern Corn Belt, and dry weather in other regions of the country.
- Farmers planted the second highest spring wheat crop in modern times following the 1996 60-year high. Area had been expected to drop back to the 1995 level after increasing sharply in 1996 due to strong spring wheat prices. However, another spring price runup--due mostly to the mid-April 1997 freeze in the Southern Plains and severe flooding in the Red River Valley--apparently provided farmers sufficient incentive to increase 1997 plantings above their March intentions.

Changing Demand

Bulk Commodity versus High-value Product Exports: Agricultural exports are a key component of farm income, equal to about 30 percent of cash receipts and high-value product exports have become an important component of the trade picture. The value of high-value product exports surpassed that of bulk commodities earlier in the decade and it is anticipated that it will enjoy almost a two-thirds share 10 years from now. However, the growth in high-value product exports is not necessarily to the detriment of producers of bulk commodities. Corn is heavily dependent on trade even though domestic use dwarfs the export volume of corn because much of the domestic use of corn ends up overseas through the export of livestock products. It is estimated that more than one-fourth of our corn and more than one-half of the soybeans moves overseas, either directly in bulk, as an intermediate product (soybean meal or oil), or indirectly through livestock and products.

The Asian Crisis: The current financial crisis in Asia raises concerns about its impact on U.S. agricultural exports, especially over the next few years. When USDA's long-term baseline was completed last November, the crisis was assumed to be limited to the four major Southeast Asian economies: Indonesia, Thailand, Malaysia and the Philippines. It was also assumed the impact would be relatively short-lived with the largest impact in Thailand. U.S. corn exports to the region were expected to be hurt the most, but after 2000 imports by this region were expected to return to the previously projected growth rates.

Economic forecasters have moved from an assumption of “minimal effect” to the reality that the crisis is spreading to other countries in the region, it will likely last longer, and it will have a greater impact on the economic performance on some U.S. businesses, including agriculture. However, forecasters cannot settle on a consensus regarding the depth, severity and expansiveness of the situation.

The importance of Asia to the economic well being of our farmers cannot be understated. The value of U.S. agricultural exports shipped to Asia was \$23.8 billion in fiscal year 1997, or 41 percent of the total value of agricultural products we send overseas. We shipped almost \$10 billion worth of wheat, coarse grains, and soybeans and products to Asia in fiscal year 1997.

The Asian crisis will directly reduce demand for U.S. agricultural exports because of a slowdown in the region’s consumer spending and the declining value of the Asian currencies relative to the U.S. dollar. The declining value of the Asian currencies makes imports from the United States more expensive. Higher-valued U.S. exports to the region will be reduced more than exports of bulk commodities, particularly in the near term.

Overall, we estimate that the Asian crisis could reduce worldwide U.S. agricultural exports by 3 to 6 percent over the next two years from the levels that would have been if these countries maintained their rapid growth.

It is important to keep in mind that despite financial problems, Asia remains an important market with much potential. The factors that made Asia strong economically in the past will fuel its recovery in the future. These include a high rate of savings, low inflation, a well-educated population, and economies that, for the most part, have potential for strong growth after short-turn downturns. The medium-term fundamentals will become sound with institutional reforms that allow bankrupt firms and banks to be closed, with reductions in government-directed investment, and with the elimination of monopolistic trade agencies. Ultimately, the *IMF*-led reforms in these countries will lead to more transparent, freer markets in which U.S. agricultural products will find it easier to compete.

Outlook for 1998

The 1998/99 forecasts presented below are different from the projections contained in the publication *USDA Agricultural Baseline Projections to 2007*. The most recent forecasts were updated in mid-February, while the baseline projections to 2007 were developed last November. Tables 1 through 5 show the Department’s current supply and demand projections for 1998/99 for wheat, corn, soybeans, soybean oil, and soybean meal. USDA’s first official forecast for 1998/99 will be published in May, based in part, on survey-related data from *NASS* and attache reports from *FAS* offices overseas.

Overview for 1998: In comparison to the last few years, smaller changes in acreage are anticipated for 1998. Soybean and corn acreages are expected to increase marginally, while wheat acreage will likely contract. The extent of the decline in winter wheat acreage planted last fall, and reported last month, caught most by surprise. Little is noteworthy on the demand side

for wheat; both domestic use and exports are expected to increase marginally. Corn exports are expected to rebound, with continued increases in domestic use. The outlook for soybeans can be characterized as a year of “records,” including record levels of planted acreage, production, supplies, and total use. Another record crush is also expected for soybeans, but exports may decline marginally. Prices will likely fall or remain unchanged for wheat, corn, soybeans, soybean oil and meal, with dramatic price declines expected for soybeans and soybean meal.

Wheat Supply: Wheat planted acreage in 1998 is forecast to be 68.5 million acres, down 2.5 million acres from last year. Yields are expected to fall 1.7 bushels per acre below this year to a trend estimate of 38 bushels, as the record yield in winter wheat is not expected to be repeated. U.S. wheat production is expected to decline about 9 percent from this year, due to both fewer planted acres and the lower yield.

Winter wheat planted for harvest in 1998, as reported in the *Winter Wheat and Rye Seedings Report* released last month, is expected to be 46.6 million acres, 4 percent below 1997 and the lowest since 1973. We anticipate spring plantings (including durum) to be 21.9 million acres, down for the second consecutive year from the near-record established in 1996. Some of the decline in spring acreage is attributed to larger CRP enrollment in North Dakota and continued large oilseed acreage.

Hard red winter area accounted for most of the winter acreage decline, down 5 percent from last year. Except Oklahoma, plantings in the major producing States were all down. Montana acreage declined to the lowest since 1941. Nebraska farmers may have planted the smallest crop in its history. Kansas seedings are 700,000 acres below last year.

White winter wheat seedings were also down about 5 percent from a year ago. Idaho producers apparently planted the smallest crop in that state since the early 1970's.

Soft red winter wheat seedings were above 1997 because of increases from Arkansas through Illinois. In Ohio, acreage remains unchanged from 1997. In the southeast, wet conditions and late harvests delayed or even prevented wheat seedings. Many of those states are estimated to have reduced seedings from 1997.

Questions have arisen regarding the cause of the decline in winter wheat seedings and will continue until the *Prospective Plantings Report* is issued in March. The estimated level was about 2 million acres below the low end of the range of industry estimates released prior to the USDA report. Likely causes of the reduced plantings include:

- Producers switching to crops such as oilseeds and feed grains to improve crop rotation and because of better price expectations for other crops. Contributing to the shift may be increased flexibility provided under the 1996 farm law.
- Producers planning to increase their hay acreage, or even put the land in summer fallow.

Wheat Demand, Stocks and Prices: Despite smaller acreage, lower yields and a corresponding decline in production, 1998/99 is shaping up similarly to 1997. Bigger carryin stocks will offset

the reduced production and cause total supplies to be about unchanged. Total use is expected to be up slightly from last year, with a small gain expected for domestic use. U.S. export volume is expected to increase marginally; the U.S. market share remains at about 30 percent and world trade is expected to be about unchanged. U.S. stocks are relatively unchanged, and prices will likely remain near the 1997 level of \$3.45 a bushel.

Outlook for Global Wheat Trade: World trade in 1998 is expected to be little changed from this year's forecast. A continued increase in imports is expected in Latin America and the Middle East in response to economic growth. This will be offset by reductions in North Africa due the expectations of larger crops. The uncertain outlook for Asia will determine whether world trade rises or falls in 1998.

A significant portion of China's 1998 winter wheat crop was planted in dry soils, making spring moisture conditions critical. However, China's slow growth in wheat consumption and the large gain in wheat stocks from their record 1997 crop means large wheat imports are unlikely. Also, Indian imports depend upon growing conditions in coming months because of some poor weather conditions at planting. Less feed wheat is expected to be imported by South Korea, and some Southeast Asian countries are likely to reduce imports. Indonesia is a key unknown, with imports depending on whether they maintain consumer subsidies.

For the competitors, area is expected to decline, but production is likely to be up because of the EU. Thus, the United States is expected to continue to face intense competition in world markets.

Corn Supply: Based on continued strong prices for corn, plantings are expected to climb slightly to 81.5 million acres, up 1.3 million from 1997. Trend yield analysis suggests that corn yields will average 130 bushels per acre. Corn production in 1998 is expected to increase to near 9.8 billion bushels, approaching the record crop of 10.1 billion in 1994. With carryin stocks estimated at 949 million bushels, corn supplies are projected at 10.75 billion bushels.

Corn Demand, Stocks and Prices: Corn demand for 1998 is projected at a record 9,735 million bushels, up 425 million from 1997. U.S. exports are projected up 275 million bushels, or up 7 million tons from this year.

Domestic use of corn is expected to increase 150 million bushels in 1998 to 7,835 million bushels. Feed use is estimated to reach 5,950 million bushels, up 100 million bushels. Food, seed, and industrial (FSI) uses of corn are expected to increase 50 million bushels to 1,885 million. Fuel ethanol production (a component of FSI use) is expected to account for 525 million bushels, up 10 million bushels from 1997, and corn used for sugars and starch is projected to increase 40 million bushels, accounting for 1,070 million bushels of FSI use.

Near term growth in ethanol production is limited, due to the uncertainty of the federal tax exemption for ethanol used in motor fuels. The tax exemption, which is about 54 cents per gallon of ethanol, is scheduled to expire on December 31, 2000. Expansion of ethanol production capacity in the near term is most likely to occur in States where State programs

provide special investment incentives. Longer term growth depends on whether the excise tax exemption is renewed for ethanol beyond 2000.

Because projected corn production in 1998 exceeds expected use, corn ending stocks are projected to increase 65 million bushels to 1,014 million. The ending corn stocks-to-use ratio increases marginally to 10.4 percent, and the season average corn price is projected to be near \$2.55 per bushel, or about unchanged from 1997.

Outlook for Global Corn Trade: Most of the increases in projected U.S. exports are due to reduced competition, with China the key. China is projected to drop from a net exporter of almost 5 million tons to a net importer of around 1 million. Eastern Europe's exports are likely to drop, and even Argentina is expected to export less than this year. Also, global imports are projected to show a small rise as income gains push up livestock demand and feed ingredient imports for a number of countries. The aggregate imports for South Korea and Southeast Asia are assumed to be down only slightly from the current forecast for this year. Remember that most of the reduction in the forecast for 1997 exports in recent months has been because of larger competition from Argentina, China, and Eastern Europe. South Korea would have purchased feed wheat and corn from competing suppliers, even without a currency crisis. Also, there would have been a huge Argentine corn crop and large exports, with or without the Asian crisis.

Soybean Supply: Soybean planted acreage is expected to reach a record level of 71.5 million acres, compared with last year's 70.9 million and marginally above the previous record set in 1979. Soybean acreage is at levels last seen in the late 1970's and early 1980's when prices were record high and double-cropping was considerably higher. The biggest increases in soybean acreage in recent years have been in the Lake States and Northern Plains.

Using a 39.5 bushel per acre yield--up 0.5 from last year and second only to the 1994 level of 41.4--will result in a crop of 2,780 million bushels, 2 percent above last year's record of 2,727 million bushels. Total supplies are expected to be 3,028 million bushels, 6 percent above the record set in 1997.

Soybean and Products Demand, Stocks and Prices: Domestic crush in 1998 is expected to be 1,545 million bushels, 2 percent above last year. Exports are expected to decline to 945 million bushels, off about 2 percent from 1997, because of increased competitor supplies. U.S. ending stocks for 1998 are expected to increase to 400 million bushels, or 63 percent above the estimated 1997 level, and the highest level since 1986. Prospects for a record U.S. soybean crop and a large South American crop are expected to push soybean prices down \$1.25 from this year, to about \$5.25 per bushel and the lowest in more than 10 years.

As is the case for soybeans, the 1998 balance sheet for domestic soybean meal and oil is expected to show many records including production, total supplies, domestic use, and total use. Soybean oil exports are also expected to be at a record level. Continued strong global demand for soybean products, coupled with tightening global oil stocks is expected to keep soybean oil prices around 26.5 cents per pound, about the same as is estimated for 1997. However, soybean meal prices are expected to decline to around \$160 per ton, down from an estimated \$202.50 per ton in 1997.

Domestic prices for other oilseeds, such as sunflowers, canola, rapeseed, safflower, flaxseed, and cottonseed, will likely be higher relative to soybean prices because of the globally tight oil market. The value of these oilseeds is principally determined by the value of the oil they produce. Thus, with a strong global vegetable oil demand and reduced output, the prices of high oil-yielding crops should strengthen relative to soybeans.

Outlook for Global Soybean and Products Trade. Reduced prospects for U.S. soybean and soybean meal exports in 1998 are related to a strong rise in 1997 Southern Hemisphere soybean crops. These record crops harvested in the spring of 1998 are expected to hurt U.S. export prospects. This marks a big turnaround from the fall of 1997 when both Brazil and Argentina imported record amounts of U.S. soybeans. While U.S. exports are most seriously impacted in the October to March period of 1998/99, they may do much better in the following six months as new crop soybean production in South America stalls, with Argentina possibly retrenching as area planted to soybeans drops and yields are assumed to be more normal following this year's ideal growing conditions.

Foreign soybean meal use and imports will experience a reasonably good year, despite Asian financial woes. Soybean meal use could be up by 3.5 to 4 percent, compared to about a 5.5 percent growth in 1997. Soybean meal imports could grow 3.5 percent, compared to 6 percent in 1997. Chinese demand for soybean meal is forecast to remain strong, growing by around 10 percent and other non-Asian markets are anticipated to accelerate usage of soybean meal in response to good economic growth and much weaker soybean meal prices.

In contrast to soybeans and soybean meal use and trade abroad, soybean oil will likely do much better, with soybean oil trade up by 5 percent or more. Continued strong gains in Chinese consumption of vegetable oils, along with a marked slowdown in Southeast Asian palm oil production and exports, will support strong gains in soybean oil trade and use as well as for the high oil content seeds such as sunflowerseed and rapeseed. Global production of palm oil normally grows more than 1 million metric tons annually, but it grew only a modest 0.2 million tons in 1997. With dry weather continuing in the region, growth will likely continue to be weak into 1998.

Conclusion

We have seen how acreage increased in 1996 and stayed at that high level in 1997. Relatively strong prices, healthy yields and virtually no government restrictions (or inducements for that matter) encouraged producers to plant the greatest number of acres in 10 years. For the most part, the market has found a home for this "extra" acreage, even when the weather provided for record or near record yields. If the Asian crisis results in a moderate and short-term decline in U.S. agricultural exports, sufficient demand still exists to cause wheat and corn prices to remain firm, but weaker prices are anticipated for soybeans. In the longer-term outlook, we anticipate that continued global demand for our products will pull additional acreage into production, even with large enrollment in the CRP.

The trend in soybean acreage is particularly notable. Soybean acreage increased to levels last recorded in the late 1970's and early 1980's when prices were record high and double-cropping

was considerably higher. And soybean acreage has not been at the expense of corn acreage--a traditional trade-off--because corn acreage has also increased for 2 years running. Soybean acreage has even increased in the Southeast, Appalachia, and the Delta regions where there have been steady declines since peaking in the early 1980's. The biggest increases in soybean acreage in recent years have not been in prime soybean country, but in the Lake States and Northern Plains. This implies that traditional soybean growers are planting more acres and other growers are planting soybeans for the first time.

Because of the combination of current favorable soybean prices, relatively high yields, and rotation practices favoring more oilseeds, we expect soybean acreage to increase again in 1998. However, soybean prices will be pressured in 1998 because of increased acreage, a buildup in stocks, slack global demand for U.S. soybean meal and expected low meal prices. If soybean prices fall to \$5.25 as we anticipate, everyone will be wondering how acreage will shift in response to *lower* prices. Since I won't be presenting the Department's outlook next year (they wouldn't ask someone to make presentations in consecutive years, would they?), stayed tuned to next year's Outlook Forum when a different speaker will be forced to address this tough question.

Table 1. Wheat: Supply, Demand, and Price

	1996/97	1997/98 ^{1/}	1998/99 ^{2/}
Area planted (million acres)	75.6	71.0	68.5
Area harvested	62.9	63.6	60.5
Yield (bushels/acre)	36.3	39.7	38.0
Production (million bushels)	2,285	2,527	2,300
Beginning Stocks	376	444	674
Imports	92	90	100
Supply	2,753	3,060	3,074
Feed and residual	314	300	300
Food, seed, & industrial	995	1,011	1,022
Total Domestic Use	1,309	1,311	1,322
Exports	1,001	1,075	1,100
Total Use	2,310	2,386	2,422
Ending Stocks	444	674	652
Farm Price (per bushel)	\$4.30	\$3.45	\$3.45
1/ Forecast.	2/ Projected.		

Table 2. Corn: Supply, Demand, and Price

	1996/97	1997/98 ^{1/}	1998/99 ^{2/}
Area planted (million acres)	79.5	80.2	81.5
Area harvested	73.1	73.7	75.3
Yield (bushels per acre)	127.1	127.0	130.0
Production (million bushels)	9,293	9,366	9,790
Beginning Stocks	426	883	949
Imports	13	10	10
Supply	9,733	10,259	10,749
Feed and residual	5,362	5,850	5,950
Food, seed, & industrial	1,692	1,835	1,885
Total Domestic Use	7,054	7,685	7,835
Exports	1,795	1,625	1,900
Total Use	8,849	9,310	9,735
Ending Stocks	883	949	1,014
Farm Price (per bushel)	\$2.71	\$2.55	\$2.55

1/ Forecast. 2/ Projected

Table 3. Soybeans: Supply, Demand, and Price

	1996/97	1997/98 ^{1/}	1998/99 ^{2/}
Area planted (million acres)	64.2	70.9	71.5
Area harvested	63.4	69.9	70.4
Yield (bushels per acre)	37.6	39.0	39.5
Production (million bushels)	2,382	2,727	2,780
Beginning Stocks	183	131	245
Imports	9	6	3
Supply	2,575	2,865	3,028
Crush	1,436	1,520	1,545
Seed and residual	125	140	138
Total Domestic Use	1,561	1,660	1,683
Exports	882	960	945
Total Use	2,443	2,620	2,628
Ending Stocks	131	245	400
Farm Price (per bushel)	\$7.35	\$6.50	\$5.25

1/ Forecast. 2/ Projected.

Table 4. Soybean Oil: Supply, Demand, and Price

	1996/97	1997/98 ^{1/}	1998/99 ^{2/}
Beginning Stock (million pounds)	2,015	1,520	1,550
Production	15,743	16,970	17,305
Imports	53	60	70
Supply	17,811	18,550	18,925
Domestic Use	14,247	14,500	14,725
Exports	2,045	2,500	2,750
Total Use	16,291	17,000	17,475
Ending Stocks	1,520	1,550	1,450
Average Price (cents/pound)	22.5	26.0	26.0

Table 5: Soybean Meal: Supply, Demand and Price

	1996/97	1997/98 ^{1/}	1998/99 ^{2/}
Beginning Stocks (1000 short tons)	212	207	225
Production	34,209	35,843	36,650
Imports	102	125	100
Supply	34,523	36,175	36,975
Domestic Use	27,322	28,500	29,500
Exports	6,994	7,450	7,250
Total Use	34,316	35,950	36,750
Ending Stocks	207	225	225
Average Price (\$/ton)	\$270.90	\$202.50	\$160.00

1/ Forecast.

2/ Projected.

SLIDES

Grains and Oilseeds Outlook for 1998 Acreage Shifts and Shifting Demand The USDA Perspective

**Bradley Karmen
Farm Service Agency
February 24, 1998**

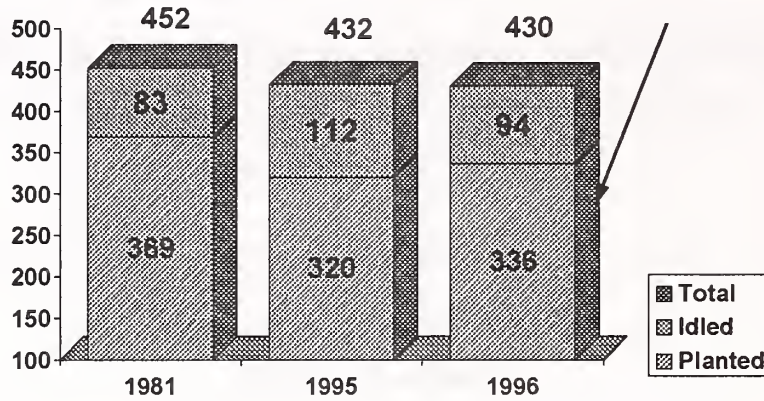
Acreage Shifts and Shifting Demand

- **Land Use and the CRP**
- **Acreage Shifts: Lessons Learned**
- **Shifting Demand**
- **1998 Supply and Demand Estimates**

U.S. Crop Land Use

million acres

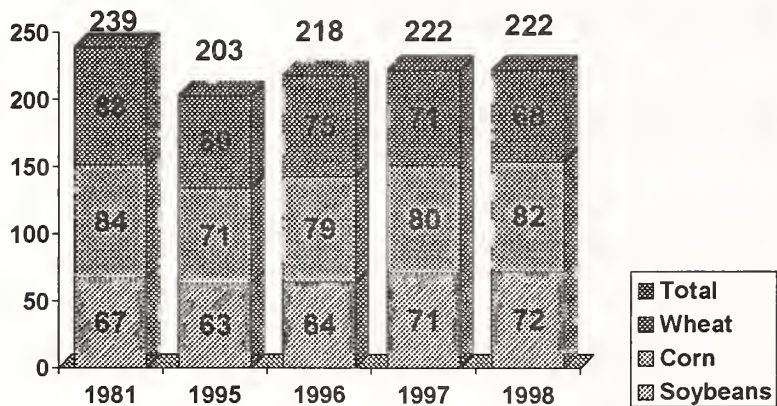
Note: 16 million acre increase in planted acres in 1996



U.S. Planted Acres

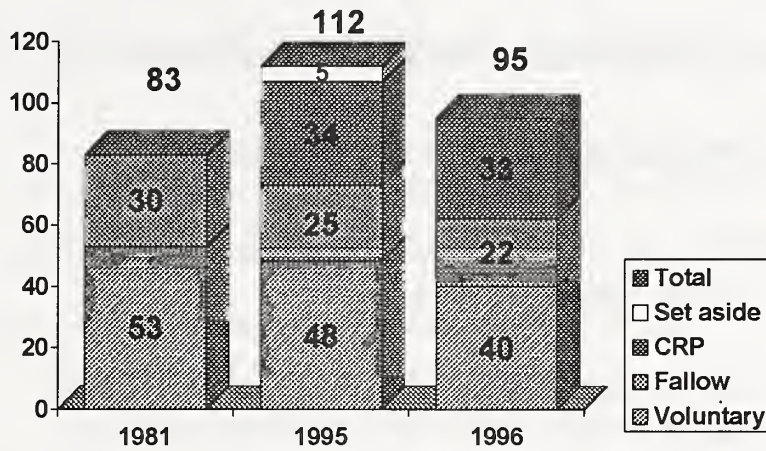
Corn, Soybeans & Wheat

million acres



Land Idled in the US

million acres



1996 Examples of Acreage Shifts

- 16 million acre increase in plantings
- Corn, wheat, sorghum and soybeans up
- Cotton, oats, sunflower down
- Delta: doubled corn acres, reduce cotton
- Sorghum: planted after failed cotton & wheat
- Corn Belt: higher corn, beans and wheat

1997 Examples of Acreage Shifts

- **6.7 million acre increase in soybeans**
- **Continued decline in cotton acres**
- **Bean acres increased most in Lake States and Northern Plains**

Also in Southeast, Appalachia and Delta where acres have been declining since 1980

More Examples of Acreage Shifts: Focus on Wheat

- **Spring 1996: highest spring plantings since 1933**
- **Winter 1996: lowest winter plantings since 1978**
- **Spring 1997: 2nd highest spring plantings since 1933**
- **Winter 1997: lowest winter plantings since 1973**

The Importance of Asia

- 41 percent of US agricultural exports go to Asia
- \$10 billion of wheat, coarse grains, soybeans and products shipped to Asia
- Nearby decline in total US ag exports of 3 to 6 percent
- Longer-term export picture unchanged

Wheat Supply and Demand

	1997/98	1998/99
Area planted (million acres)	71.0	68.5
Yield (bushels/acre)	39.7	38.0
Production (million bushels)	2,527	2,300
Domestic Use	1,311	1,322
Exports	1,075	1,100
Ending Stocks	674	652
Farm Price (per bushel)	\$3.45	\$3.45

Corn Supply and Demand

	1997/98	1998/99
Area planted (million acres)	80.2	81.5
Yield (bushels/acre)	127	130
Production (million bushels)	9,366	9,790
Domestic Use	7,685	7,835
Exports	1,625	1,900
Ending Stocks	949	1,014
Farm Price (per bushel)	\$2.55	\$2.55

Soybean Supply and Demand

	1997/98	1998/99
Area planted (million acres)	70.9	71.5
Yield (bushels/acre)	39.0	39.5
Production (million bushels)	2,727	2,780
Domestic Use	1,660	1,683
Exports	960	945
Ending Stocks	245	400
Farm Price (per bushel)	\$6.50	\$5.25

Acreage Shifts: Lessons Learned

- **Weather-induced changes: legislation always allowed farmers to respond**
- **Shifting between crops: 1996 farm bill gives producers more flexibility**
- **Planting more acres: Recent corn plantings equal or exceed base-acre constraints from 1990 law. Previous legislation may have indirectly reduced bean acres.**

Prospects for 1999

- **Current high prices cause soybean and corn acreage to increase in 1998.**
- **Slack demand for soybean meal and large soybean stocks in 1998 cause soybean prices to drop to \$5.25.**
- **How will farmers respond to low prices in 1999?**

AN INDUSTRY PERSPECTIVE ON THE OUTLOOK FOR OILSEEDS

Dale Gustafson

Vice President, Futures Division, Grains and Oilseeds Division
Solomon Smith Barney

The supply side of the 1997-98 world oilseed crop is now reasonably well defined. Thanks to high prices in the previous year, the area devoted to the 5 major oilseeds production rose by nearly 5% in 1997-98 and the average yield increased by 4%. The USDA's February report pegged world production of the five major oilseeds at over 272 million tonnes, up nearly 23 million from the previous year. Soybeans account for nearly 90% of the total increase in production. The US soybean crop was up 9.4 million tonnes but the most important change from a competitive standpoint was that the South American crop topped 50 million tonnes and was 8.4 million greater than a year ago. Let us turn our attention to the demand side of the market.

During the fall quarter, US domestic usage of soybean meal rose by only 2.2 % to about 7.68 million tons. Double digit increases in the number of cattle on feed and a 7% increase in hog inventories contributed to the larger meal usage. However, industry pipelines had been reduced to minimal levels in the summer of 1997 due to tight bean supplies, large board inverses and high basis values. Since South America had aggressively marketed much of their 1997 crop before new crop US supplies became available in September, US processors also had to stock export pipelines in order to meet projected record exports of US meal during the late fall and winter months. Since it is unlikely that the Census crush report fully accounts for meal in pipelines, the resulting domestic usage calculation tends to be inflated.

Reductions in the projected growth rate for meat exports at a time of substantially increasing red meat supplies have contributed to reduced margins for both livestock and poultry producers and will lead to a slower production growth rates in coming months. Above normal temperatures in the US during the winter months increased feeding efficiencies but probably acted to limit feed usage. Mild winter weather conditions and plentiful moisture supplies should encourage the early season grazing of pastures and winter wheat. In addition, US soybean meal faces large supplies of competitively priced alternate protein feedstuffs.

Because of these considerations, we anticipate that domestic meal usage during the 1997-98 crop year will increase by only about 0.7 million tons to 28.0 tons. While this will be a record usage, the forecast is about 0.5 million tons below the usage shown in the February Supply/Demand report.

US soybean meal exports during the fourth quarter of 1997 were a record 2.6 million tons. This was up more than 0.7 million from the previous season and largely reflected the sharply reduced supplies of meal exports from South America. During the fall quarter, world trade in soybeans and meal on a meal equivalent basis from the US, Brazil and Argentina increased by 1.35 million

tonnes. However, keep in mind that this increase included US soybean shipments to Brazil of just over 600,000 tonnes and to Argentina of about 475,000 tonnes that allowed South American processors to capture relatively strong processing margins last fall. Adjusting for the trade among the four exporting nations, net world exports were up only 0.65 million tonnes on a meal equivalent basis. It is noteworthy that shipments to China were down about 400,000 tonnes from the record volume of a year ago. This reduction may have been due in part to both heavy imports during the summer quarter and China's larger 1997 soybean crop. Excluding China, Japan and Taiwan, shipments to all other Asian destinations were down only about 150,000 tonnes of meal equivalents from a year ago. Increased US credit allocations to various Asian nations could help the US compete in coming months. The only concern as to whether US meal exports will reach our current 7.6 million tons projection relates to the pace of shipment through March. If the US still has large volume of unshipped sales on the books by April 1, switches to South America will be likely, especially in light of recently released export registration data for Brazil showing both and meal sales down by more than half from last year.

Based on our current assessment of meal demand, the US crush is expected to reach 1506 million bushels, up 51 million from a year earlier but about 9 million below the current Outlook Board projection. US export sales of soybeans have remained above year earlier levels so far this season. At one point in early October, US soybean sales were as much as 161 million bushel ahead of the previous year. However, declining processing margins and bearish price attitudes by overseas buyers based on expectations for a record South American crop have significantly slowed the pace of new purchases. Total export commitments through mid-February were only 30 million ahead of last year. South American producers may prove to be strong holders in anticipation of higher prices caused by possible crop problems in the US this spring and summer, giving US sales a boost later in the year. Our current export projection of 953 million is slightly lower than the estimate of the Outlook Board. Carryout stocks of soybeans are estimated at about 260 million bushels and points to an average annual price for nearby futures in the \$6.50-6.70 range. Since the average price for nearby soybean futures during the first half of the season is nearly \$6.80, there will be limited potential for a price rally unless driven by weather considerations.

The most important development in the world vegetable oil market in the 1997-98 crop year is the projected decline in Malaysian palm oil production that reflects that lagged effect of below normal rainfall in 1997. The growth in Indonesian production will also be slowed by below normal rainfall. Production in both countries also has been affected by an extended period of smog created by land clearing operations in Indonesia. Shipments of palm oil from Indonesia in early 1998 have been disrupted by the economic crisis. During the past 5 years, production of palm oil in Malaysian and Indonesia has increased by an average of 800,000 tonnes and exports have increased by 550,000 tonnes. Combined production this year will be down about 100,000 tonnes. The normal growth in world demand in 1997-98 will have to met from both a draw down in palm stocks and increased imports of competing vegetable oils. This will be supplied in large part by increased exports from South America, Canada and the US.

Prospects for large shipments from South America have been trimmed by crop losses in sunseed and oil yields that have probably been reduced due to the cool, wet growing season. Since palm oil exports from Malaysia are fully refined, many of the Malaysian buyers may be forced to seek larger supplies of refined oils. South America is not believed to have excess refining capacity

and European refiners are busy with shipments into the FSU. This could, therefore, boost US exports of refined oils during the next six months. The increased shipments of refined oil are also likely to provide a lift to US refining margins this season. US exports through the first quarter of the season totaled 841 million pounds and were 195 million ahead of last year. US exports of all other fats and oils during the fall quarter increased by about 190 million to 820 million pounds. If soybean oil shipments in the current quarter reach the projected 1.2 billion pound level, US exports for the entire crop year should reach at least 2.6 billion pounds.

The Outlook Board raised the soybean oil yield earlier this month to 11.2 pounds per bushel. However, the final yield may prove to be slightly higher. Based on our lower crush forecast, soybean oil production in 1997-98 is forecast a record 16.9 billion and will be about 70 million less than the current USDA estimate.

During the 1993, 1994 and 1995 crop years, US domestic use of 13 fats and oils increased at an average annual rate of only about 270 million pounds and compared to an annual increase of over 600 million in the previous five seasons. This slowdown in consumption was related to the rapid industry shift to a host of new reduced-fat and no-fat products. During the 1996-1997 season domestic usage of fats and oils climbed by nearly 700 million pounds. We believe the increased expansion in usage signals that the demand for reduced or no-fat products has been satiated. Sales of many of these new products have fallen and consumers are returning to products with higher fat levels. The national introduction of a new line of snack foods by this Spring that have been prepared from the Procter & Gamble Olestra product is expected to be a net addition to demand due to both the increased amounts of oil used in the manufacturing process and new consumers.

Total fats and oils usage in the 1997-1998 year is forecast to increase by about 600 million pounds. Adjusting for the available supply of competing fats and oils results in domestic usage for soybean oil of 14.7 billion pounds. Apparent domestic use of Soybean oil during the October-December quarter totaled 3.88 billion pounds, up more than 220 million from the same period last year.

US Carryout stocks of soybean oil on October 1, 1998 are estimated at 1.18 billion pounds and 340 million less than a year ago. The oil share of product value may climb into the 46-48% range. Soybean oil futures could reach into the 32-34 cent range.

Based on the recently released enrollment in the 16th signup of the CRP, USDA has estimated that the seeded acreage to all crops in 1998 could increase by about 2 million acres. Expected reductions in the seeded area for cotton, winter and spring wheat could allow for an overall increase in all other crops of nearly 4.5 million acres. Area increases in rice, sunflower, canola and durum wheat should rise in total by about 1.5 million, leaving about 3.0 million acres to be divided between corn and beans. Our current soybean area estimate for 1988 of 72.3 million acres is up about 1.4 million from last year. The potential for corn planting delays in the South, or producer concerns for drought this summer could add to the soybean area.

A year ago sea surface temperatures in the equatorial Pacific had already begun to rise, but were still below normal. The temperature climb continued unabated during the balance of the year. By mid-spring, the world was aware of the developing El Niño and the event soon became the

most widely heralded meteorological story in modern history. The trade began to focus on those areas of production that would be influenced by the El Niño episode. The Indian monsoon was the first concern. The monsoon was late in arriving in key oilseed areas, but subsequent rainfall was timely and India enjoyed record yields in 1997. El Niño usually adversely affects Australian wheat but timely rains resulted in yields being slightly above trend. Brazil and Argentina typically enjoy above trend yields in an El Niño episode and this year appears to have been no exception. South Africa typically suffers corn losses during this phase of an El Niño event. While planting and crop development has been affected by heat and dryness, a disastrous outturn has been averted so far by occasional periods of rain and cooler temperatures. Despite the differing outcomes of this El Niño on foreign agricultural production, the attention of the market will soon be riveted on North American weather.

The current El Niño event peaked in December with sea surface temperatures at about 4 degrees C above normal, making it the strongest episode of the century. The second strongest event was in 1892-83, which peaked in January 1983 at 3.6 degrees. The 1987-88 peaked in September 1987 at just over 2 degrees C. In terms of both intensity and timing, the 1982-83 event is most similar to the current season. Sea surface temperatures have already declined by more than one degree and the rate of decline in February is greater than in January. Sea surface temperatures also fell sharply in February and March of 1983. The demise of the event substantially increases the prospects of more and extended heat this summer in the central and eastern US. The extent of heat will be a function of the rate of change in sea surface temperatures between now and summer. The more rapid the decline in SST's, the more likely the chance for hotter temperatures this summer.

The US and Canada has experienced a classic El Niño winter. The southern and coastal areas of the US have been wet. The central and northern areas have had above normal temperatures and the northern areas of the US and Canadian Prairie Provinces have had below normal precipitation. The pattern was similar in 1982-83.

During this declining phase of an El Niño event, there is a strong tendency for a cool April and May, especially in the central US. The Delta is likely to remain wet. Other areas that could be wet include the southeastern US and the Ohio River region. The northern states and Canadian prairies will tend to stay dry. Forecast for precipitation this spring in most of the Midwest is extremely difficult to forecast at this time. Some planting delays are likely in the South and parts of the Midwest. Cool temperatures could delay crop development. Heat and dryness during July and August are always problems for spring seeded crops.

The US trend line yield for soybeans in 1998 is 39.3 bushels per acre. With a trend yield production, could reach 2.78 billion bushels. Based on the yield deviation from trend in 1983 and adjusting for the upward shift in soybeans yield in recent years, we would estimate the worst case US soybean yield in 1998 at just over 34 bushels per acre which would drop production to about 2.44 billion bushels.

Domestic demand for meal in the 1988-89 season is expected to rise by about .65 million relative to the current year. However projected South American soybean stocks on September 1, 1998 could be as much as 4 million tonnes greater than a year ago. US meal exports could fall by about one million tons. The soybean crush is forecast at 1490 million bushels. Exports could

climb slightly to about 965 million bushels. With a trend yield, US carryout stocks could climb to about 450 million bushels which would drop prices under \$5.50 and push board meal prices into the mid \$150 range and even allow oil to fall to about 24 cents. Under the low yield scenario, carryout stocks would fall to about 100 million bushels and carry futures prices for soybeans to over \$8.00, meal to \$230 and oil to 35 cents.

Thank you.

U. S. SOYBEAN MEAL SUPPLY/DEMAND BALANCE (October-September)(thousand tons)

		USDA	SB	SB
		02/98	Proj.	Proj.
	96/97	97/98	97/98	98/99
	-----	-----	-----	-----
BEG. STOCKS	212	207	207	313
PRODUCTION	34209	35843	35650	35200
IMPORTS	101	125	81	100
	-----	-----	-----	-----
TOTAL SUPPLY	34522	36175	35938	35613
DOM. DISAP.	27315	28500	28007	28650
EXPORTS MEAL	7000	7450	7618	6750
	-----	-----	-----	-----
TOTAL USAGE	34315	35950	35625	35400
END. STOCKS	207	225	313	213

U. S. SOYBEAN OIL

SUPPLY/DEMAND BALANCE

(October-September)(thousand tons)

		USDA	SB	SB
		02/98	Proj.	Proj.
	96/97	97/98	97/98	98/99
	-----	-----	-----	-----
BEG. STOCKS	2015	1520	1520	1176
PRODUCTION	15743	16970	16902	16835
IMPORTS	51	60	54	200
	-----	-----	-----	-----
TOTAL SUPPLY	17809	18550	18476	18211
DOM. USAGE	14244	14500	14700	14950
EXPORTS	2045	2500	2600	1900
RE-EXPORTS	0	0	0	0
	-----	-----	-----	-----
TOTAL USAGE	16289	17000	17300	16850
END. STOCKS	1520	1550	1176	1361

**U.S. SOYBEAN
SUPPLY/USAGE BALANCE**
(September-August)(million bushels)

		USDA	SB	SB
		02/98	Proj.	Proj.
	96/97	97/98	97/98	98/99
ACRES PLANTED	64205	70850	70850	72250
% HARVESTED	0.988	0.986	0.986	0.983
ACRES HARVESTED	63409	69884	69884	71000
AVERAGE YIELD	37.6	39.0	39.0	39.3
CARRY-IN	183	131	131	260
PRODUCTION	2382	2727	2727	2790
IMPORTS	10	6	5	5
TOTAL SUPPLY	2575	2864	2863	3055
CRUSH	1436	1520	1506	1490
EXPORTS	882	960	953	965
SEED	79	78	79	78
FEED/RESIDUAL	47	61	65	65
TOTAL USAGE	2444	2619	2603	2598
STOCKS	131	245	260	457
STOCKS-TO-USE	5.4	9.4	10.0	17.6

1998 COARSE GRAINS AND WHEAT TOPICS

Dick Smetana

Director of Research, AgResource

Today, I will begin as a discussant regarding the USDA wheat and coarse grain presentation, but I would also like to present five additional observations for possible discussion as they relate to grains in general.

We at AgResource do not have any major disagreement with either the 1997/98 wheat or coarse grain demand projections other than slight changes in the export assessments. We believe that implicit in this year's analysis of corn is the assumption that China will become a significant importer of corn during the latter half of the marketing year, if the 1997 Chinese corn crop is truly 105 million tons. Secondly, we believe that the South African maize crop is closer to six million tons than the February USDA forecast of 7.5 million tons.

We do have problems with the 1998/99 analysis, as can be seen on the above corn supply/demand slide. The 1998 corn acreage is too high, given the present soybean to corn price ratio, on whatever basis one cares to equate the two crops (nearby on-farm or Chicago cash, nearby futures or new crop futures).

Farm Act of 1996 Implications

Our analysis would suggest that old models of these price relationships must now take into account the fact that the pre-1996 Farm Act history of the relationship implicitly included the corn deficiency payment. This allowed bean to corn ratios of 2.4 to 1 to be considered as acreage neutral. This is not the case any longer. As shown in the slide above, such ratios now foster the planting of beans at the expense of corn. Without a crop specific deficiency payment, corn requires a ratio in the 2.1 to 2.2 range to maintain its acreage base. To date the market has not indicated such a signal, and therefore, corn will lose acreage to soybeans again in 1998. Some of the loss in 1998 corn acreage in the Cornbelt will be offset by gains in the South at the expense of cotton and the shifting of Plains winter wheat acreage to feed grains. If the spring season begins under a threat of dryness (fostered by the rapid decline in the El Nino temperatures), the movement towards soybeans, and away from corn, could even be more severe than the 500,000 acres we are currently forecasting. Incidentally, the same scenario is partially responsible for the continuing loss of wheat acreage, as was amply demonstrated in the loss of 1.7 million winter wheat acres this past fall. **POINT - Wheat and corn, without their crop-specific deficiency payments, cannot compete on a level similar to pre-1996 Farm Act conditions.**

Another point I would like to emphasize is that under AgResource's estimate for the world 1998 coarse grain crop, we have a forecast of 928 million tons. But given a smaller carryin and expected strong demand, the 1998/99 stocks buildup will not be large and the world will remain dependent on no major crop problems throughout the world during the 1998/99 season.

World Stocks and Market Volatility

This latter point, **minimal stocks**, carries a very important consequence, volatility. Carryover stocks, both world and U.S., for wheat and coarse grains are near historically low levels and will continue as such for the foreseeable future. This fact becomes evident in the above graph of world stocks of grain for both wheat and coarse grains. Note that during the past 20 years, the rest of the world's stocks of coarse grains have ranged between 75 to 100 million tons. Meanwhile, the U.S. contribution to world coarse grain stocks has ranged from 153 million tons in 1987 to a level of 14 million tons in 1996. The USDA, and as a result the United States, is no longer willing to maintain control of grain storage for the benefit of the entire world.

This becomes very evident in the accompanying slide, which depicts the amount of grain in the CCC inventory over the past two decades. Note that at the peak in 1987, there were 3.0 billion bushels present in CCC inventory (78 million tons). Included were 2.2 billion bushels of coarse grains, mostly corn, and three-quarters of a billion bushels of wheat. In addition in 1987, as seen in the next slide, the Farmer-Owned-Reserve, which was considered pseudo-government control of grain, reached 2.7 billion bushels (70 million tons), of which corn contributed 1.6 billion bushels. Together these two programs controlled 5.7 billion bushels, or 147 million metric tons of grain at its peak. Today, the combined grain under control of these two programs is 95 million bushels, with CCC wheat comprising 93 million bushels and corn two million.

The lack of USDA involvement in grain storage has reduced total U.S. grain stocks holdings. As a result, the current and recent stocks-to-use ratios of the grains lie on the left end of the accompanying price slide. Without the U.S. involvement in the storage business, lower stocks/use ratios will continually occur. **POINT - The present and future volatility of grain prices will be greater than in the past, as annually the location of future supply/demand/price curves will occur at the steep end of such charts, where small variations in perceived stocks will cause large ranges in prices changes. This is a hazard that will remain with us for the foreseeable future.**

The U.S. Storage Situation

My third point regards a situation that has crept up on the U.S. agricultural community, but it will impact on future years and could dominate both farmer planting and marketing decisions and those of the subsequent merchandising, storage and transportation of grains. The problem to which I am referring is the U.S. grain storage situation. This past fall, evidence of this problem was made manifest which when combined with a shortage of railcars in the Plains and Midwest, resulted in large piles of grain on the ground. Most saw this as a transportation problem, but underneath this transportation situation is a problem that is just asking for quality and logistical problems to develop due to the lack of storage space. There is enough blame to be thrown around to cover everyone in the business.

The above slide captures data from the January USDA stocks and storage report and indicates that the U.S. storage capacity has continued to decline over the past ten years, both on-farm and off-farm. It tells a tale of continued abandonment of grain storage, with only isolated increases of newly built facilities. During the past two years, off-farm stocks declined by 4.6 percent to 7.9 billion bushels, while on-farm storage declined by 2.0 percent to 10.9 billion bushels. This is not

a new phenomenon; it has been going on since 1987 for on-farm storage and since 1986 for commercial storage. This represents an annual average decline of 259 million bushels in on-farm storage and 167 million bushels in off-farm storage.

On-Farm Storage

Prior to the mid-eighties, on-farm storage was in an expansive stage, sponsored by the USDA's Storage Facility and Equipment Loan Program. As seen in the next slide, the 10-year decline in on-farm storage has been the greatest, in absolute terms, in the Western Cornbelt, down one billion bushels, with declines of over 300 million in both Iowa and Minnesota. In relative terms, the on-farm storage decline has been even greater (over twenty percent) in the Southwest, the Southeast, the Pacific NW, and the Delta regions.

Off-Farm Storage

The story of off-farm storage is much the same. See the slide above. With the advent of the 1985 Farm Act, the government became an active entity in its disownership of grain stocks. An overwhelming proportion of USDA-CCC grain stocks were housed in commercial, off-farm storage. The advent of the 1988 drought allowed the CCC to accomplish this task more rapidly than had been planned. CCC inventory has continued its downward trend and is presently at 95 million bushels.

The off-farm grain storage decline has been most prominent in the Western Cornbelt and the Southwestern regions. Nebraska and Texas have experienced the largest absolute declines in off-farm storage. There are localized examples of replacement construction, but there appears to be no movement towards enlarging the U.S. commercial storage capacity.

The fact is that off-farm storage continues to decline in the face of rising production and demand trends for both corn and soybeans. Thus, the pipelines for both these dominant Cornbelt crops have fostered carrying charges to promote commercial storage. The obvious solution is to encourage the building of storage. Although all grains and oilseeds are forecast to have relatively tight carryouts, their respective markets have experienced wide carrying charges. This is one of the incentives that must be present on a regular basis to encourage the building of storage.

Where should this storage be located? There is the school of thought that the consumers of these grains - millers, processors and exporters - should maintain a greater degree of control over their sources of grain, particularly if future markets, as mentioned earlier, are destined to remain volatile. That would suggest that such consumers might be encouraged to expand their own storage to maintain control, to some degree, of their supply requirements, as they foresee them to be, over the next decade. However, to offer the most efficient use of future storage, the most favorable site for newly built storage would be at the source - farms and local elevators. This would then allow the system the greatest degree of flexibility to satisfy future unforeseen demand. **The point is not whether a crunch will occur; rather, it's just a question of when.**

Funds and Prices

A fourth point. A funny thing happened on the way to price discovery over the past half year. It appears that the Funds, under the listing of Large Speculators, have played an enormous role in

the price levels of the grains. Let me present two slides. Note that the price of wheat, in this case March wheat, has a definite relationship to the size of the Large Spec trade position. The correlation comes to 97 percent, and is significant. Just as striking is the comparison between the March corn price and the Large Spec net position. In this case, the correlation was over 82 percent. The soybean relationship is very strong at over 93 percent. Though the Large Spec position represents only 7 to 11 percent of corn open interest, at any given time, it is the Funds collective net position that moves the market to either side of a market neutral value. **The point is that the price channel, in which the price discovery of grains is being traded, has widened considerably during recent years due to the Funds. A fact that those in the market would not contest.**

Feeding Survey

A final plea. Those who know me will recognize this request. The grain industry needs a national survey on feeding. Such a survey should be on a state basis and should include feeding by grain-type and animal-type. Unaccountable residuals for the grains continually appear in the quarterly stocks reports. For corn, the residual can reach one billion bushels annually and has caused this inconsistent correlation of animal demand versus the quarterly feed-residual (calculated from the stocks report). Another example shows the recent history of the wheat feed-residual with back-to-back quarterly feed-residuals oscillating between quarters by nearly 500 million bushels, 20 percent of the entire wheat demand for a year. **The trade needs a better barometer of feeding demand, a sector that is responsible for over five billion bushels, or over 50 percent of grain's annual demand.**

There are other topics which are worthy of discussion such as the Southeast Asian situation and El Nino, but I'm sure they will come up in the following Q & A period.

Thank you again for this opportunity.

U.S. WHEAT SUPPLY / DEMAND

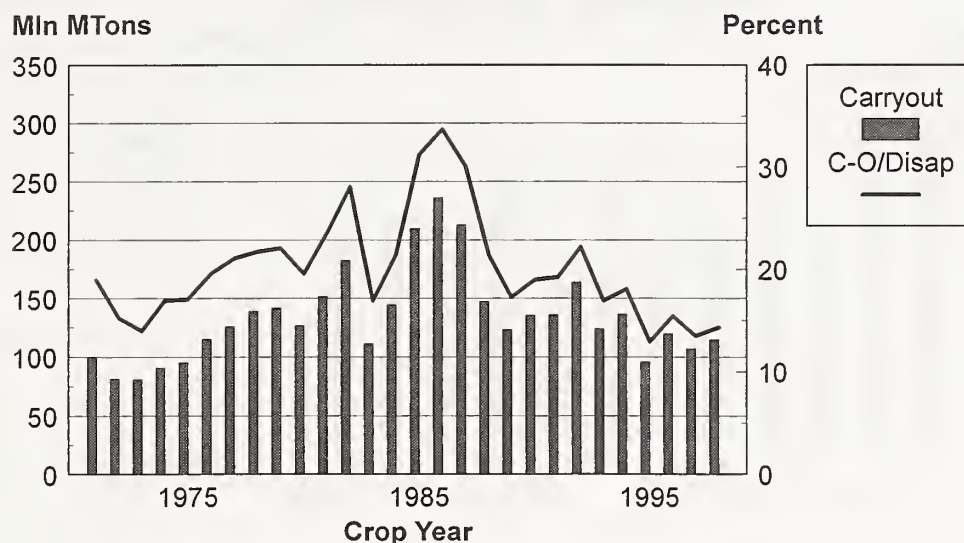
in million bushels

	1995/96	1996/97	USDA 1997/98	ARC 1997/98	ARC 1998/99
PLANTED ACRES, MLN	69.1	75.6	71.0	71.0	69.2
HARVESTED ACRES, MLN	60.9	62.9	63.6	63.6	61.5
YIELD, BU/ACRE	35.8	36.3	39.7	39.7	40.2
CARRYIN, JUNE 1	507	376	444	444	600
PRODUCTION	2,183	2,285	2,527	2,527	2,475
IMPORTS	68	92	90	88	90
TOTAL SUPPLY	2,758	2,753	3,061	3,059	3,165
FEED/RESIDUAL	153	314	300	310	327
FOOD	883	891	915	910	925
SEED	104	103	96	96	100
TOTAL DOMESTIC	1,140	1,308	1,542	1,316	1,352
EXPORTS	1,241	1,001	1,075	1,143	1,225
TOTAL DISAPPEARANCE	2,381	2,309	2,617	2,459	2,577
CARRYOUT, May 31	376	444	444	600	588
STOCK/USE, %	15.8%	19.2%	17.0%	24.4%	22.8%
Farmer Price, \$/Bu	\$4.55	\$4.30	\$3.50 \$3.50	\$3.57	\$3.75

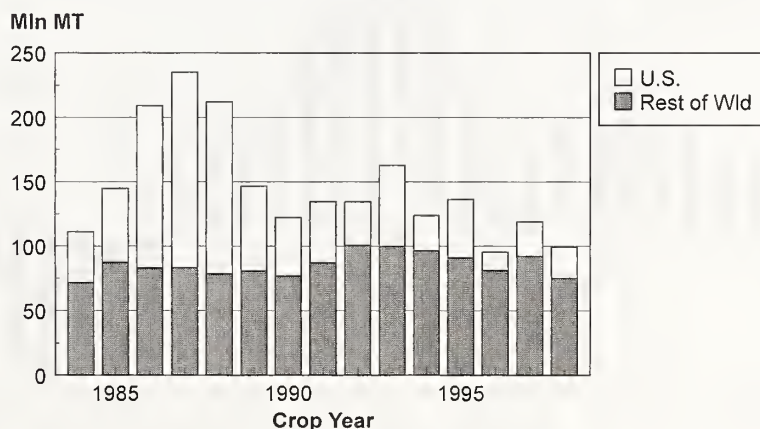
U.S. CORN SUPPLY / DEMAND
in million bushels

			USDA	ARC	ARC
	1995/96	1996/97	1997/98	1997/98	1998/99
Planted Acres, Million	71.2	79.5	80.2	80.2	80.7
Harvest Acres, Million	65.0	73.1	73.7	73.7	74.2
Yield, Bushels/Acre	113.5	127.1	127.0	127.0	132.0
PRODUCTION	7,374	9,293	9,366	9,366	9,800
CARRYIN, SEPT 1	1,558	426	883	883	936
IMPORTS	16	13	10	10	10
TOTAL SUPPLY	8,948	9,733	10,259	10,259	10,747
FEED/RESIDUAL	4,697	5,364	5,850	5,847	5,900
FOOD/SEED/IND	1,598	1,691	1,835	1,830	1,893
TOTAL DOMESTIC	6,294	7,054	7,685	7,677	7,793
EXPORTS	2,228	1,795	1,625	1,645	1,875
TTL DISAPPEARANCE	8,522	8,849	9,310	9,322	9,668
CARRYOUT, AUG 31	426	883	949	936	1,078
STOCK/USE RATIO	5.0%	10.0%	10.2%	10.0%	11.2%
ON-FARM PRICE, \$/BU	\$3.24	\$2.71	\$2.45 \$2.65	\$2.65	\$2.60

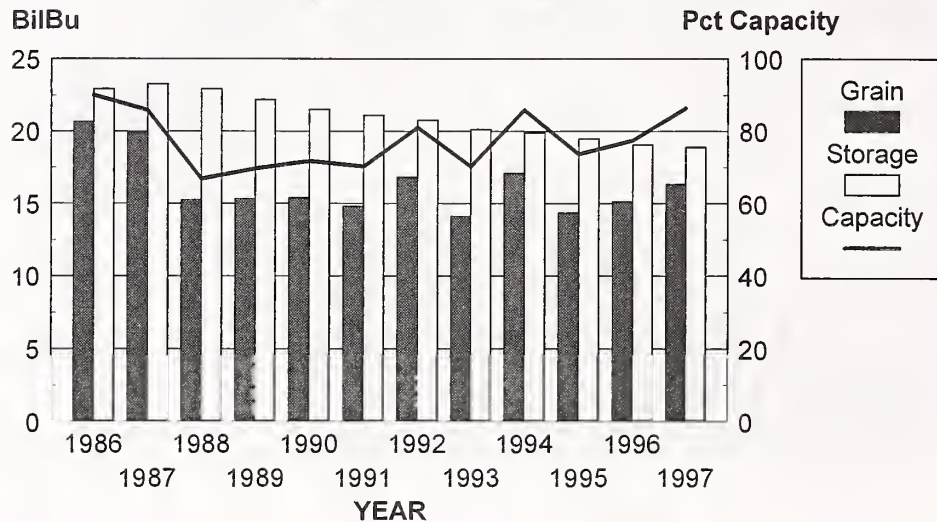
World Coarse Grain Stocks in million tons - % disappearance 1971 - 1999



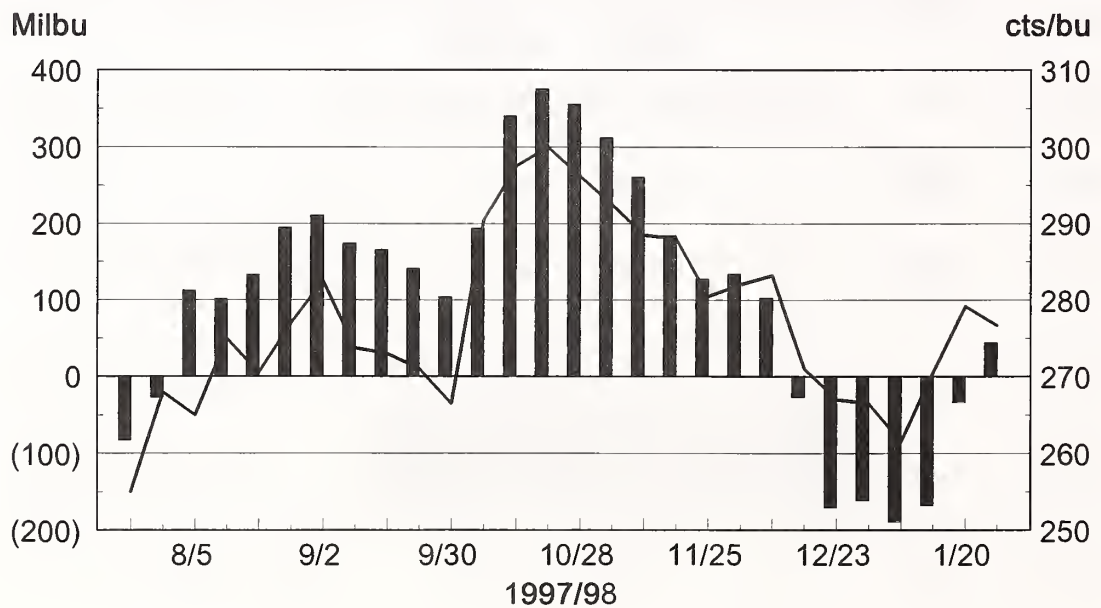
World -U.S. Coarse Grain Stocks 1983 - 1998 in million metric tons



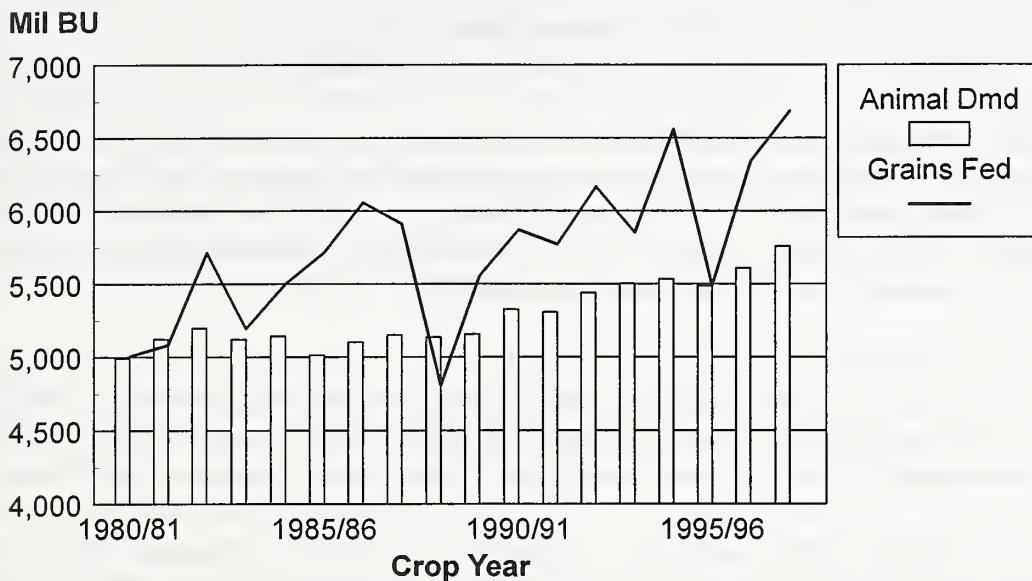
US Harvest Total Storage Situation Pct Capacity - Billion Bushels



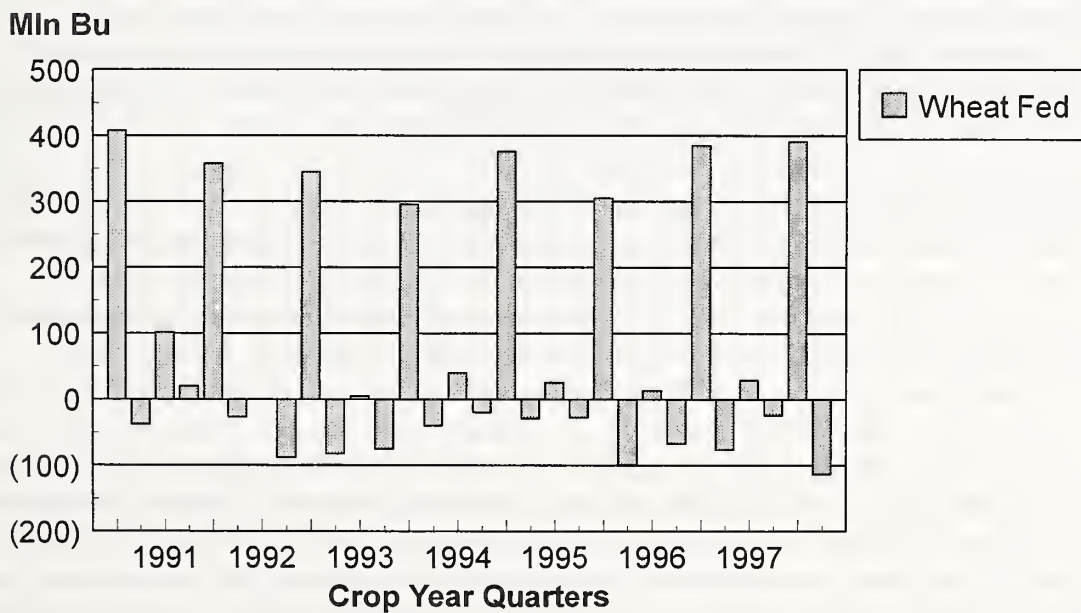
Large Spec (Funds) Net Corn Position in million bushels



5 Grain Feed-Residual vs Animal Feeding Demand in million bushels



Quarterly Wheat Feed-Residual in million bushels



OUTLOOK FOR DAIRY

James J. Miller
Economic Research Service, USDA

Nothing very dramatic is expected to happen to either the supply or demand for milk and dairy products in 1998, following on the heels of a year more notable for what did not happen than for what did. In 1998, milk production is expected to be near the 1997 level, while dairy demand grows moderately. With no clear sense of market direction, dairy prices may well stay volatile but are projected to average only slightly higher than in 1997.

Prices of concentrate feeds and forages may ease in 1998 but will stay relatively high through at least most of the year. Expected returns are not likely to upset the balanced trend and structural adjustments that have held milk output fundamentally stable in recent years. Sluggish growth in milk per cow is expected to only barely outweigh a 1-percent decline in milk cow numbers.

Continued economic growth is expected to sustain the good, but not spectacular, dairy demand of recent years. However, reactions to prices above those of earlier in the nineties will pare away some of the potential growth in commercial use. In addition, large stocks of nonfat dry milk and the probable spring lapse in exports under the Dairy Export Incentive Program (DEIP) will weaken price rises.

Milk Production Stagnant

In 1997, milk producers handled very tight supplies of dairy-quality forage better, avoiding a repeat of 1996's spring collapse in milk per cow, and their cows benefitted from relatively favorable summer weather. Other than these two factors, milk production in 1997 was very similar to 1995 and 1996. The almost 157 billion pounds produced last year was less than 1 percent more than in 1995, although more than 1 percent larger than in 1996.

Milk-feed price relationships help explain some of this stability in milk output. The milk-feed ratio has spent most of recent years in the range normally associated with below-trend growth in milk per cow. Correspondingly, milk per cow, except for the direct and indirect effects of weather, has grown quite modestly. Although the milk-feed ratio will be more favorable during part of 1998, the 1998 average is projected to be a moderately unfavorable 1.6--not much incentive to boost grain feeding and milk per cow.

Returns over concentrate costs in 1997 were higher than they had been in the early nineties but fell about 11 percent from the strong 1996 returns. The stronger returns of 1996-97 did not do much to slow declines in milk cow numbers. The increases were insufficient to significantly alter the position of those dairy farms under long-term income stress and many of them continued to leave dairying. Similarly, these higher returns have not yet unleashed much expansion by stronger

producers, as forage supplies and other factors have deterred growth. Returns over concentrate costs are expected to rise slightly in 1998. The cumulative effects of three years of higher returns may start to slow cow number declines by yearend.

Despite fairly large alfalfa production in recent years, supplies of dairy-quality hay have been very tight. Quality problems have been widespread in each of the last three crops, leaving only minimal stocks of good hay. Alfalfa prices reached record levels in 1997, even compared with the relatively high milk or concentrate feed prices, and had a substantial impact on the returns of those producers buying hay-- if they were able to find acceptable hay. Many more farmers were affected by the spotty quality of their homegrown alfalfa. Overall, lack of enough good forage trimmed growth in milk per cow and disrupted expansion plans. Conditions would have been much worse if the last two silage crops had not been good. Even a bumper 1998 alfalfa harvest cannot greatly ease the dairy forage problem until late 1998, although the drop in Asian alfalfa demand and the relatively mild winter has eroded prices recently.

Firm Use Seen

Dairy demand continues to benefit from the strong economy. Commercial use comparisons were strongly affected by much different pipeline stock changes in 1996 and 1997, particularly in the middle quarters. On a milkfat basis, commercial use rose almost 1 percent in 1997. Sales of dairy products on a skim solids basis were a little sluggish, slipping fractionally. Skim solids sales appeared to be more affected by delayed reactions to the high prices of 1996, and aggressive use of the DEIP pulled supplies away from domestic users.

Continued economic growth and little or no increase in retail dairy prices in 1998 should boost commercial use of dairy products. Sales of skim solids are projected to rise about 2 percent, while milkfat sales are expected to increase 1 percent again. The brisk apparent demand for milkfat during the second half of 1997 and early 1998 implies that the rise in milkfat sales would be considerably larger if supplies were large enough to avoid substantially higher milkfat prices.

Commercial stocks at the start of 1998 were close to a year earlier. Comparisons of recent butter and particularly cheese data with earlier years are not straightforward because they include warehouses that did not report in earlier years--a difference of 0.5-1.0 billion pounds milk equivalent. On January 1, holdings of butter and American varieties of cheese were moderate and inventories of most other products were tight. The only exception was continued burdensome stocks of nonfat dry milk.

International Dairy Markets Softening

International butter prices rose during most of 1997. Demand for imports was fairly brisk, while consumption increases in some exporting countries trimmed export supplies. Demand for nonfat dry milk was somewhat weaker, in part because Mexico and Algeria were importing less. Although prices generally trended downward during 1997, a modest reversal occurred during the second half. Large importers were again active and offerings were seasonally smaller.

Since November however, prices of both products began to slide. Asian demand has weakened dramatically and even some deals completed before the crisis probably will be canceled. The strength of the U. S. dollar also has trimmed prices. Lastly, New Zealand and Australia have been more aggressively selling products. During the first half of their season, these countries were conservative about making commitments because of the uncertain effects of El Niño weather. Although conditions have been dry, there is no longer the same potential for sharp production drops.

There probably will be enough international market demand to push DEIP exports to amounts allowed under the WTO, but reaching the limits for all products is not certain. Weakness in Asia may give buyers the upper hand in negotiations, slowing the sales pace. Domestic supply commitments may not be easy to obtain, particularly for products containing milkfat.

Contract activity under the DEIP slowed substantially in early 1998 after being brisk during the second half of 1997. The only allocation for nonfat dry milk that remains unfilled for the July 1997-June 1998 contract year is for less than 10,000 tons going to Latin America. The WTO limit may well be reached by this spring, with no new contracts negotiated until after the flush milk production season. Exports of butter and milkfat under the DEIP probably will not be filled because of the lack of domestic supplies. Contract activity during the second half of 1998 probably will be at a pace roughly corresponding to the WTO limits for most products, unless domestic markets are tighter than expected.

Price Volatility To Remain

Without a clearcut sense of the direction of production and use changes, milk and dairy product prices likely will continue to be pushed around by small changes in market fundamentals or pipeline stocking. If milk output stays near or above a year earlier as expected, the seasonal buildup in production should overcome the current price strength and drop spring and summer prices of cheese and milk significantly below current levels. However, strong butter prices (which may not weaken) have effectively isolated cheese prices from the nonfat dry milk market--the major weak spot in dairy markets. Even if the seasonal drop in cheese prices is fairly sharp, farm milk prices probably will stay above a year earlier during the first half of 1998.

For all of 1998, farm milk prices are projected to average only slightly above 1997's \$13.38 per cwt. However, odds probably are greater that prices will average above the projection than below. Production faltering because of forage problems or lack of farms expanding and stronger-than-expected demand represent two quite plausible scenarios that would generate much higher milk prices.

Issues for the Intermediate Outlook

Record-high alfalfa hay prices did not suddenly appear in 1997. Relative to all farm prices, alfalfa hay prices have trended upward, even though production has remained about the same. The pattern is most pronounced west of the Rocky Mountains. Western alfalfa prices have moved upward despite gradual increases in regional alfalfa production. Price increases for high quality

alfalfa hay probably have been greater than average, since some evidence indicates that quality premiums have grown.

The factors behind the large increases in Western alfalfa prices are not all known. Larger exports certainly were a factor as Japan, Korea, and Mexico have become important buyers of top quality hay. Horses certainly are strong competition for high quality hay, although it is not clear that horse demand has grown. Less beef feeding in the West probably has lessened competition somewhat, although beef demand may have a greater role in prices of lower quality hay. Much of the uptrend in alfalfa prices appears to be related to the region's growth in milk production. Milk cows, exports, and horses probably now absorb almost all of the "dairy" quality alfalfa currently being produced in the region.

The West can and is expanding alfalfa production. Recent prices make alfalfa much more competitive for land and water. In 1997, average value of California's production exceeded \$900 per acre, not exactly the "low-value" crop often depicted. However, long-term price prospects are for Western hay prices that will be significantly higher than in the past, even if prices slip from the 1997 peak. Prices within the region have become much more integrated as brokers comb the region for relative bargains. Tightness in Western hay markets even appears to be spilling over into the hay markets of the Northern Plains. The West is becoming a potential customer, rather than competitor, for Northern Plains hay sellers.

Alfalfa price increases will have several implications for the dairy industry, particularly in the West. Growth in Western production will not be as easy as in the past. Relative costs of milk production are likely to rise as producers either pay the price for top quality hay or learn to incorporate lower quality forages. Hay prices definitely will not stop development of the Western dairy industry, but they may well slow it. Also, increasing numbers of Western farmers may look east of the mountains to start new dairy operations.

Higher alfalfa prices outside the West probably will have less impact. They may even make it easier to establish large, industrial-style dairy farms if they stimulate development of commercial hay markets in northern dairy areas. Dairy farmers in all areas probably will have to adjust their thinking about dairy rations, as alfalfa may not be a cheap source of nutrients to be fed to the limit of the cow's capacity.

Development of new large dairy herds appears to have slowed recently--despite higher returns in 1996-97. The longer-term increase in these operations in the North indicates that such farms can be competitive, even though the largest size category in the NASS data includes more than just the "new-style" operations. The number of large operations has grown in the Lake States, Northeast, and West, while slipping in other areas. In the core dairy regions, growth in the number of large farms, particularly those larger than 400 cows, seems inevitable in light of economies in investment and efficiencies of specialization of labor and management.

Expansion of large farm numbers was relatively restrained in much of 1996 and 1997 and is expected to be in much of 1998, partly because of forage problems and milk price volatility. Starting a new operation or greatly expanding an existing farm sharply boosts a producer's financial vulnerability, even for the best managers. Risks from the lack of an assured supply of

high quality forage for expansion were particularly important recently because farmers could not rely on being able to find acceptable hay if they fell short. Similarly, the recent volatility in milk prices probably deterred some expansions. Even though prices wound up averaging higher, the added risk may have been too much.

These expansion-minded producers will not be denied forever. A major uncertainty for the pattern of milk production and prices in the next few years is the pace of such growth. A surge of expansions (possibly even starting in late 1998) might drop milk prices significantly lower than expected during the next few years. On the other hand, continued conservatism might mean the exit of other farms will result in stagnant or even declining milk output and rising milk prices.

Slower expansion in the number of western dairy farms may be more persistent. In addition to the changes in the western alfalfa markets, there may remain fewer places in the region where milk production can mushroom into a dairy center such as Roswell NM or Twin Falls ID. Future emergence of new areas may come at the expense of established areas.

Lastly, the growth of large dairy farms increasingly will be affected by environmental restrictions on large units. The days of dairies being relatively uninhibited, compared with other animal operations, clearly are over. However, discussion of this topic is best left to the experts who will follow.

THE OUTLOOK FOR LIVESTOCK AND POULTRY

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Record grain costs in 1996 and fluctuating export markets have kept livestock producers in an uncertain planning environment. Adjustments made in production plans over the last two years have been dominated by reactions to random events rather than systematic changes based on long term market conditions. Due to a hot dry summer in 1995 corn prices peaked in the 1995/96 crop marketing year. Soybean meal prices increased substantially also, but they did not peak until the 1996/97 crop marketing year. Forage quality and availability have also been poor during the last couple of years. Feed costs were the highest during the summer of 1996, but continued at relatively high levels through 1997. Export market disruptions have included export bans and tariff collection changes in Russia and the bird flu in Hong Kong for poultry. For red meats export fluctuations have been caused by food safety scares and tariff fluctuations in Japan, E-coli testing in Korea, and by disease problems in the hogs of export competitor Taiwan. More recently the Asian financial market crisis has brought reductions in purchasing power and uncertainty about the effect on U.S. exports.

Producer adjustments led to beef production falling below a year earlier starting in the second half of 1996 and continuing the decline in the first half of 1997, while pork production was below a year earlier for all of 1996 and the first half of 1997. Slower production increases for poultry began in the second quarter of 1996 and carried through all of 1997. Annual increases in beef production are not expected to return until after 2000. A much shorter biological cycle will result in pork production increases and slight poultry production expansion acceleration over the 1998-2000 period. Smaller increases in poultry production and reductions in pork production are expected after 2000 as corn prices increase and bring higher feed costs and beef production begins to increase.

Continued economic growth and declining real prices of meat will allow consumers to purchase more meat with a smaller share of disposable income over the baseline period. Declining real prices require increases in efficiency of meat production, processing, and marketing if profitability is to be maintained. Poultry's generally lower price is expected to enhance its share of meat consumption, with poultry consumption on a retail weight basis projected to exceed red meat consumption in 2004. Continued consolidation of firms at all levels in the meat industry are expected as more efficient firms acquire those that are not adjusting rapidly enough or as less efficient firms are eliminated.

Beef Production Declining Through 2000

Sharply higher corn and hay prices in the 1995/96 crop year led to declines in feeder cattle prices during late 1995 and 1996. Prospects for lower returns for cow calf operations brought increased beef cow marketings in the fall of 1995. Beef cow marketings peaked in 1996 but female stock slaughtering continued quite strong in 1997. Placements of cattle on feed were also disrupted by the high feed costs. Feeder cattle were kept on pasture for longer periods, where possible, in order to reduce the amount of time they would have to be fed with high priced grains. This meant more cattle than ordinarily would have been available were placed in feedlots during 1997. Higher than expected placements of heifers, in the second half of 1997, also kept feedlot placements quite high.

Reductions in cattle inventories due to smaller calf crops is expected to continue through 1999. Recovery in cattle inventories is expected to begin in 2000 with numbers reaching 102 million by 2007. This would continue a trend of lower peaks in cattle numbers in each production cycle since the peak in cattle numbers in 1975 at 132 million head. Increasing slaughter weights and higher percentages of calves entering feed lots have offset most of the decline in cattle numbers keeping meat production declines much smaller than cattle number declines.

Feeder cattle are expected to spend more time on pasture in the future. This will result in heavier cattle entering the feedlot and continued increases in cattle weights at slaughter. More efficient use of feed and increased availability of pasture with smaller cow numbers are driving this trend.

The beef market is becoming increasingly segmented. Highly marbled choice and prime cuts are going primarily to exports and restaurants, while select cuts are being sold mostly at retail and lean beef is being imported for use in ground products. This trend could provide some opportunities for producers to coordinate production with product traits that processors require, in order to obtain price premiums. These arrangements are relatively rare at this time but are increasing and may have to increase in the future if increased efficiency of beef production is to be realized.

The financial crisis in Asia and tightening supplies of beef in the U.S. during 1998-2000 will keep the U.S. as a net importer of beef until the last half of the baseline period. Asia is the primary export market taking nearly two-thirds of U.S. exports in 1997. Canada and Mexico each took between 10 and 15 percent of exports. They are expected to increase purchases of U.S. beef as the Asian markets shrink in 1998.

Pork Production To Increase Through 2000

Hog producers had already begun to decrease production in the last half of 1995 due to low hog prices in late 1994, before the high feed costs became a factor. High feed costs extended the reduction in production through the first half of 1997. Loss of small operations during the low profitability periods and more large operations being built has changed the structure of the hog

industry. More stable production, increased market coordination, and product standardization is expected with the larger operations.

Very strong increases in production are taking place now and are expected to continue through the third quarter of 1998. More moderate increases in production are expected to continue in 1999 and 2000. Three years of small production declines are expected in 2001-2003 and then small production increases for the rest of the baseline period.

Per capita consumption of pork on a retail weight basis is expected to increase from last year's 49 pounds per person to about 54 pounds by 2000, the highest since 1981. Production declines and increases less than the rate of population growth in later years are expected to bring per capita consumption back to 49 pounds per capita.

Pork exports are expected to double over the baseline period, reaching about 2 billion pounds by 2007. Japan took nearly half of U.S. pork exports in 1997. Canada and Mexico are expected to import more product as sales to Japan are expected to soften. Pork imports are expected to decline slowly, continuing the current trend.

Broiler Production Increasing More Slowly

High feed costs in late 1995 and 1996 and export market disruptions in early 1996 brought slower broiler production increases starting in the second quarter of 1996. Continued relatively high feed costs and increased enforcement of tariff collections on poultry imports in Russia kept producers cautious in 1997 and led to the smallest broiler production increase since 1983. Slightly stronger increases in production are projected for 1998-2000 as beef production declines accelerate and pork production increases moderate after 1998.

Increases in broiler production are expected to run much below the 40 year average of 5-6 percent per year after the year 2000. More attention seems to be being shifted to value added product marketing and development of home meal replacement options than to increasing the quantity of commodity product that is being produced for retail or fast food outlets. Maintaining production increases and increasing market share becomes harder as total poultry approaches surpassing red meat consumption on a retail weight basis in 2004.

After two years of low net returns to turkey producers and with the prospect of 9 percent higher pork production in 1998 turkey production is expected to decline in 1998. This would be the first production decline since 1982. Competition with sharply lower priced pork trimmings in export markets and with hams on the domestic market is expected to keep pressure on turkey prices. Turkey production increases later in the forecast period are expected to about keep pace with population increases and keep per capita turkey consumption relatively constant at 18-19 pounds per capita.

Egg production is currently fairly profitable and egg production is increasing. Per capita egg consumption reached the highest level since 1988 last year, 239 eggs per person. Increases in

egg product consumption of 3-4 eggs per person more than offset declines in shell egg consumption of 1-2 eggs in 1997. Table egg production increases are expected to slightly outpace population increases and bring per capita egg consumption to 245 eggs per person by 2007. The trend to increased use of eggs as ingredients in further processed food products and reduced consumption of shell eggs is expected to continue through the baseline period.

Poultry Exports To Continue Increasing

Poultry exports are expected to continue increasing through the baseline period, but at a much slower pace than in the mid 1990s. The Asian crisis is expected to affect poultry exports less than for the red meats since relatively low valued poultry items are exported. Also Asia does not represent as large a share of U.S. export sales at about 25 percent. Russia leads for broiler sales with over 40 percent, while Mexico takes over 30 percent of turkey exports.

The Role of Trade in U.S. Horticulture

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International trade has become increasingly critical to the success of the U.S. horticulture sector. In 1998, U.S. horticultural exports are forecast to reach a record \$10.8 billion, up 7 percent from the previous year and nearly double the level of 1990. The share of U.S. horticultural production that is exported has grown from 20 percent in 1990 to 27 percent in 1997, and is forecast to reach 28 percent in 1998. Even with the large growth in exports over the last 8 years, the United States remains a net importer of horticultural products, with imports rising from \$8.2 billion in 1990 to a forecast of \$12.8 billion in 1998. When considering the trade balance in the U.S. fruit and vegetable sector, there have been years, as recently as 1995, of trade surplus. Exports expand markets for domestically produced products and imports generally fill seasonal voids in domestic production. More than 80 percent of the value of U.S. horticultural imports are attributed to purchases of fresh and processed fruit and vegetables, including nuts and wine, and nearly one-sixth of all fruit and vegetable consumption in the United States come from imports.

U.S. horticultural producers are projected to post 3 to 4 percent annual gains in production value after 1998, based on slight increases in domestic consumption and 1 to 2 percent increases in output and price. Income growth of trading customers and increased market access are some factors affecting the long-term outlook for horticultural trade. Horticultural exports are projected to increase 5 to 7 percent annually, with fruit and vegetable exports accounting for 98 percent of total export value, while import value is projected to grow at a steady rate of 4 percent per year. With these anticipated long-term projections, net horticultural trade could favor exports by the end of the next decade.

Factors Affecting U.S. Fruit and Vegetable Trade Prospects

The outlook for U.S. fruit and vegetable trade is shaped by long-term and short-term factors. Some of the underlying long-term factors are the income growth of trading customers and increased market access stemming from trade liberalization. Any deviations from the long-term trend are a result of short-term factors that can intermittently hinder or help trade prospects of U.S. producers. Examples of these short-term factors are changes in currency exchange rates and fluctuations in world supplies. Some other factors, on the other hand, such as trade barriers and productivity changes from technology adoption may either have a long-term or short-term effect.

Global economic growth will fuel export demand for U.S. fruit and vegetables through the turn of the century. As a country's income grows, their demand for high-valued commodities are expected to increase but at a diminishing rate. The wealth effects of income growth are more pronounced in developing countries. Wealthier countries, such as the U.S., are likely to spend diminished shares of increasing incomes on food items, while developing countries (an increasingly important customer for U.S. exports) are expected to continue to spend larger shares

of new income on food items. This result, combined with the fact that the developing Asian markets as well as South American countries are expected to experience higher than average growth over our forecast period will be good for U.S. export prospects.

Global economic growth is projected to average over 3 percent annually over the next decade, well above the growth during 1990 to 1996. Average real GDP growth for the U.S. fruit and vegetable industries' top export markets--Canada, the European Union, and Japan--are projected higher during 1997 and beyond. Meanwhile, despite current financial problems, smaller markets in East Asia such as Hong Kong, Taiwan, South Korea, Indonesia, Thailand and the Philippines will continue to remain important markets. These markets have shown promise with stronger growth during the 1990's. Among world regions, the largest increases in U.S. fruit and vegetable exports share between 1990 and 1997 were to Asia. As soon as financial conditions turn around in these countries, U.S. fruit and vegetable exports there will likely continue strong. Real GDP growth in East and Southeast Asia is projected to average 6.8 percent for 1997-2001, down slightly from 8.6 percent during 1990-1996. South America is another developing region where growth in fruit and vegetable exports has been strong in the 1990's and economic growth there is projected to double in 1997 and beyond.

As global trade agreements are reached, increased market access for specific horticultural products will stimulate future export growth in the U.S. fruit and vegetable industry. Examples of these new markets are the opening up of mainland China last year to California fresh table grapes and Washington cherries and the opening up of Japan to most major varieties of U.S. fresh tomatoes. China continues to ban the importation of most U.S. fruit due to phytosanitary concerns. The exceptions are Pacific Northwest apples, Washington cherries, and California table grapes. While tariffs remain high for these commodities, China has already taken steps to reduce import duties for a wide range of horticultural products, including most fresh vegetable items, tree nuts and fresh fruit, processed fruit and vegetable, and juices, effective October 1, 1997. Shipments of fresh-market grapes and cherries to China in 1997, while still a very small portion of total U.S. exports for these commodities, were up sharply from 1996. Previous shipments could have come through Hong Kong. Similarly, Japan has prohibited fresh tomato shipments from almost all countries since 1951 due to phytosanitary concerns over the disease tobacco blue mold. Since June 1997, about 302 metric tons of U.S. fresh tomatoes were exported to Japan. While these new markets still need to be developed, China's projected per capita GDP growth of over 8 percent annually and its large population base and Japan's rapidly growing "western style" food service industry are indicators of their market potential.

In the short-run, the outlook for U.S. horticultural trade is clouded by currency devaluations in Asia since late summer 1997, particularly in Southeast Asian countries such as Thailand, Indonesia, Malaysia, and the Philippines, and to South Korea and Japan as well. Generally, exports of U.S. goods to markets with declining currencies will be priced relatively higher than their domestic goods, diminishing the demand for U.S. products in those countries. Meanwhile, exporters from these same countries will be in a more price competitive position in the U.S. market and third country markets. Since many U.S. horticultural product exports are not staple items in the diets of most developing Asian countries, Asian consumers are more likely to substitute U.S. products with local goods or possibly do without, particularly for commodities such as fresh fruit, wine, and nuts. U.S. exports of selected fruit and vegetables to Asian countries during September to November 1997 were lower than during the same period in 1996,

except for fresh grapes, almonds, and frozen potatoes. While Southeast Asia is a relatively small market for U.S. fruit and vegetables, the region's share of U.S. fruit and vegetable exports (in value terms) has increased from 3 percent in 1990 to about 5 percent in 1997. South Korea is also a relatively small market making up 2 to 3 percent of total export value. Japan, on the other hand, is a large market, accounting for approximately 17 percent of total export value. The Japanese yen had depreciated even before the financial crisis began in Southeast Asia and has largely contributed to reduced U.S. exports to that country. In 1996, U.S. fruit and vegetable exports to Japan fell 6 percent in value from the previous year. Through November 1997, exports have gone down 3 percent. Despite the weaker yen, Japanese demand for french fries remains strong. Imports of U.S. frozen potatoes, the top export item of the U.S. fruit and vegetable industry to this foreign market, are still up 6 percent in value terms from 1996, and are also up 11 percent in volume terms.

Fluctuations in world supplies also affect the demand for U.S. exports and U.S. demand for imports in the short run. The U.S. share of the global market increases when domestic supplies are large and/or traditional suppliers in the world market experience a decline in production. In contrast, U.S. demand for imports rises when domestic production is low and/or traditional suppliers experience a bountiful harvest. These supply factors are generally unpredictable, caused in most cases by unusual weather (either favorable or unfavorable).

A number of barriers, both natural and artificial, diminish export opportunities for U.S. producers. Depending on the nature of the barrier, the impacts to U.S. exports could either be long-term or short-term. Examples of these barriers include costly transportation of products to far off markets and legal trade barriers such as government protectionist policies. Liberalization of trade through multilateral, bilateral, and/or regional trade agreements are important in relaxing many of these existing legal trade barriers either by tariff reductions or harmonizing technical barriers to trade.

Technical barriers to trade, such as phytosanitary requirements and labeling issues, are an example of a legal trade barrier. TBTs are not necessarily associated with developed or developing countries, but rather is a process by which importing countries set standards of quality or requirements which potential trade partners must meet. For example, Japanese imports of U.S. apples, banned until 1994, are limited to Red and Golden Delicious apples from Washington and Oregon. Because of the Japanese concern for the spread of fire blight, codling moths, and apple maggots, U.S. apple shipments must meet rigorous import requirements that are very costly to U.S. apple growers. As a result, none of the growers in Washington and Oregon have registered for the 1997/98 export program, resulting in no U.S. apple shipments to Japan for this season. Another example is Brazil's mandatory fumigation at origin requirement for all U.S. fruit entering their market, effective June 1997. This requirement was imposed following the detection of Pacific spider mite and thrips in recent earlier shipments. Fresh fruit exports to Brazil increased sharply in the 1990's and this mandatory requirement could dampen prospects for future exports. Work, however, is underway to relax this requirement. For calendar year 1997, Brazilian imports of U.S. fresh fruit had fallen by about 31 percent (both volume and value) despite large U.S. crops of apples, grapes, and stone fruit.

Technological innovations can lead to achieving a larger share of the world market through a competitive advantage--either a higher quality product for the same price, or a lower price for a product of comparable quality. However, these technologies can be exported as well and so any

gains in export market shares may be short lived. The benefits of technology adoption for an exporting country are usually larger with proximity to major export markets. For example, Mexico's tomato export sector, concentrated primarily in the Sinaloa and Baja California regions, have successfully adopted technologies such as drip irrigation, fertigation, plastic mulch, and most importantly, extended shelf life varieties (ESL), which have boosted yields, decreased area planted, and lowered cost of production in the last few years. Florida had used the same technology package for the last 20 years but ESL varieties seem to adopt well in Mexico and not in Florida. Mexican export capacity rose significantly with these new varieties and the U.S. had since seen increased imports from these two regions.

U.S. producers to continue seeking growth from export markets. Export markets for U.S. fruit and vegetables continue to be an important source of growth in the U.S. horticulture sector. Total fruit and vegetable exports doubled in value in the past nine years, from \$4.3 billion in 1989 to an estimated over \$9 billion in 1997. Fruit and vegetable export share also has risen from 11 percent of U.S. agricultural export value in 1989 to 17 percent in 1997.

Over the last 12 years, sales to foreign markets have also accounted for a growing proportion of U.S. fruit and vegetable supplies. This increasing share is most significant in the U.S. tree nut industry, where the export share of domestic supplies grew from an average of 24 percent in the 1970's to 29 percent in the 1980's and to 40 percent in the 1990's. Almonds are the leading horticultural product export for the United States. Almond exports, which account for 70 percent of all tree nut exports, have increased from 48 percent of supplies in 1975 to 66 percent in 1996.

In the fresh produce industry, export gains were much more gradual. Fresh vegetable and melon exports as a share of domestic supplies averaged about 5 percent in the 1970's, 7 percent in the 1980's, and 8 percent in the 1990's. Fresh fruit exports, on the other hand, averaged 14 percent in the 1970s, 15 percent in the 1980's, and 16 percent in the 1990's. In the fruit and vegetable processing sector, the share of processed fruit exports (including wine) rose from an average of 6 percent of domestic supplies in the mid-1970's to 8 percent during the 1990's, while exports of processed vegetables, including potatoes and mushrooms, increased from an average of around 1 percent in the 1970's, 3 percent in the 1980's, and 6 percent in the 1990's.

Export markets will likely continue to expand through the turn of century, particularly as international trade agreements are reached and barriers to trade are slowly relaxed around the world. For domestic fruit producers especially, the projected continuation of relatively flat domestic consumption of U.S.-grown fruit (both fresh and processed form) point to the importance of export demand in realizing higher prices and revenues. Bananas and other tropical fruit, particularly mangoes, are projected to be the leading source of increased domestic fruit consumption during 1998-2007. However, supplies of these fruit come mostly from imports. Per capita consumption of other fresh non-citrus fruit, such as apples, grapes, pears, and peaches, is projected to increase less than 1 percent annually, while fresh citrus consumption is projected to remain flat through 2007. Per capita consumption of processed citrus products, mostly juice, as well as other non-citrus fruit products are projected to increase only by a fraction through 2007.

Fruit and vegetable imports are expected to increase at a more moderate pace. While growth in exports has been strong, the United States has remained, for most years, a net importer of fruit and vegetables. During 1997, U.S. imports of fruit and vegetables are estimated to reach \$10.0 billion

(up 6 percent from 1996), down from the nearly 16-percent increase in 1996, but consistent with the 1990 to 1996 average increase. Increased production from U.S. farms and Mexico's strengthening peso were some factors that have led to the slower growth in 1997. Imports are projected to grow at an annual rate of 4 percent, increasing to about \$10.4 billion in 1998. Part of the slowdown in growth may be attributed to Mexico's economic recovery and their expected lower production of winter vegetables due to a freeze in December.

Latin America is the largest supplier of fruit and vegetables to the United States--about 50 percent of the total value in 1997. Mexico is the United States' largest supplier of fresh produce (fruits and vegetables), accounting for over 60 percent of the value of all fresh vegetable imports and 35 percent of the total value of fresh fruit imports. Other major suppliers of fresh produce are Canada for fresh vegetables and Chile for fresh fruits. Key examples of fresh produce imports which are also produced domestically are tomatoes, sweet peppers, onions, cucumbers, melons, and other winter fresh vegetables from Mexico; grapes, stone fruit, avocados, kiwi fruit, and apples from Chile, and potatoes from Canada. For bananas, the major suppliers to the United States, accounting for over 90 percent of import value, are Costa Rica, Honduras, Guatemala, and Panama in Central America and Ecuador, Colombia, and Venezuela in South America. Western Europe supplies close to a quarter of U.S. fruit and vegetable imports, with processed products such as wine and fruit juices making up over 90 percent of the total value.

Open trade with Mexico, in line with the implementation of the North American Free Trade Agreement in 1994, and transportation cost advantage associated with the proximity of the two markets help Mexico remain as a main source of fresh vegetables for the United States. Meanwhile, the counter seasonality in fruit production between the United States and Chile has encouraged the presence of Chilean fruit in the U.S. market. Most Chilean fruit enters the U.S. market without much domestic competition during November through March and extends choices to U.S. consumers beyond the domestic winter fruit of citrus and apples. During the 1990's, Chilean fresh fruit averaged over 25 percent of U.S. fresh fruit imports.

Unlike in the fresh fruit sector, imports of Mexican fresh vegetables directly compete with domestic production, particularly from Florida, and to a much lesser extent, California, Texas, and Arizona. During the peso devaluation in Mexico in 1994, U.S. imports of Mexican fresh vegetables rose 20 percent and 15 percent in value for the following two years, respectively, with increases in volume as well. U.S. fresh vegetable exports, meanwhile, declined over 60 percent in value in 1995 but rose in 1996. Since its recovery from the peso crisis, U.S. imports of Mexican fresh vegetables had dropped 6 percent in 1997 while U.S. fresh vegetable exports to Mexico continued to increase.

U.S. imports of fruits and vegetables have become increasingly important to domestic consumption. Taking into account import categories that are most significant in volume (at least 1.0 billion pounds), imports as a share of domestic consumption has risen most significantly during the 1990's for fresh-market fruits and vegetables and canned fruit. Increased efficiency in the vegetable processing sector has provided the domestic industry a competitive advantage with foreign competitors and this could explain why canned vegetable imports are showing a declining importance in domestic consumption. Juice imports make up a large portion of fruit imports but in the last few years, juice imports have declined due mostly to lower orange juice imports.

Continued large supplies of domestic orange juice in 1997/98 will likely continue this trend of declining juice imports.

Because of the increasing importance of imports to domestic fruit and vegetable consumption, the rising concern from U.S. consumers about the safety of produce available in the U.S. market has become a major issue. One of the main concerns is microbial contamination and imports of fresh fruit and vegetables are in deeper scrutiny, not only because these products can be vulnerable to this form of contamination but also because fresh produce account for a large and growing proportion of total fruit and vegetable imports. The share of fresh-market vegetable and melon imports to total vegetable import volume rose from 46 percent in 1990 to 54 percent in 1996. At the same time, the share of fresh-market fruit imports also rose from 35 percent to 46 percent of total fruit and nut imports. Excluding imports of bananas, the share of fresh-market fruits increased from 9 percent to 13 percent, respectively. Within the past two years, two major food scare incidences in the United States were falsely linked to California strawberries. Results of the investigation pointed to imported raspberries from Guatemala and frozen strawberries from Mexico as the main culprits. Undertakings to improve food safety standards both in the United States and in foreign countries from which we import are critical in maintaining consumer confidence and demand for fruit and vegetables in the United States and other foreign markets.

Summary

The long-term prospects for U.S. fruit and vegetable trade appear good. Exports will continue to be a primary source of growth for the industry, driven mainly by world economic growth, particularly in developing regions and by international trade agreements to liberalize global trade. The Asian financial crisis will likely result in diminished demand for a number of U.S. fruit and vegetable products in that region in the short-run. Because of the strong export growth to Asia during most of the 1990's, together with projections of higher than world average economic growth there, Asia will remain an important market for U.S. fruit and vegetables, particularly as new markets, like China, emerge in that region. Similarly, increased economic growth in other developing regions, such as in South America, will help expand market opportunities for U.S. exports. Imports will continue to be a growing share of domestic consumption. Mexico and Chile will remain as major suppliers for fresh-market produce and Western Europe a key supplier of processed horticultural products.

Figure 1.

Horticultural Production and Exports To Continue To Grow

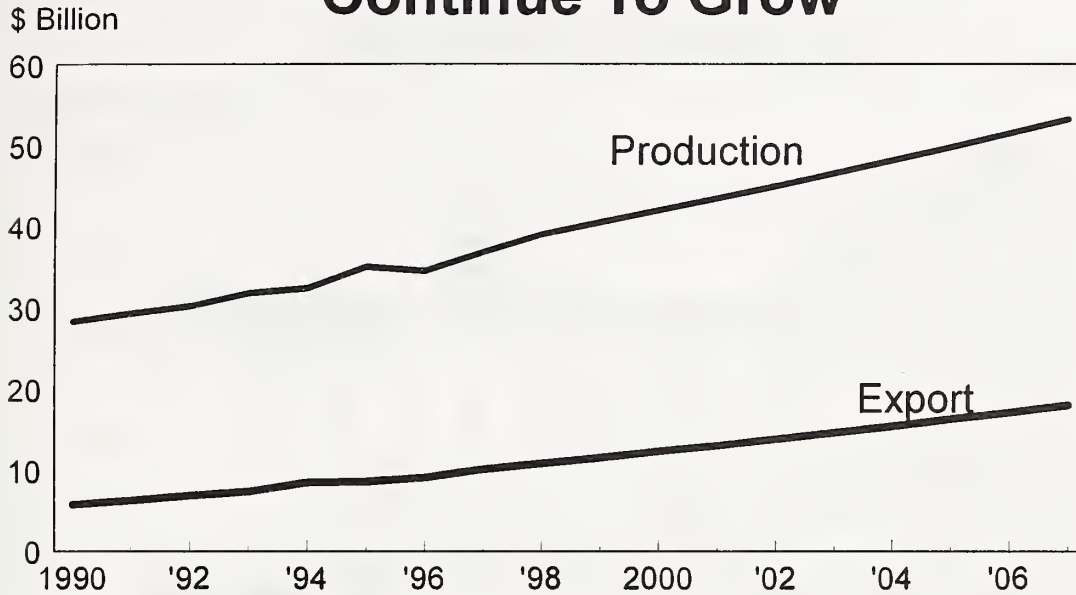


Figure 2.

Real World GDP Drives Export Growth Selected Major U.S. Fruit and Vegetables

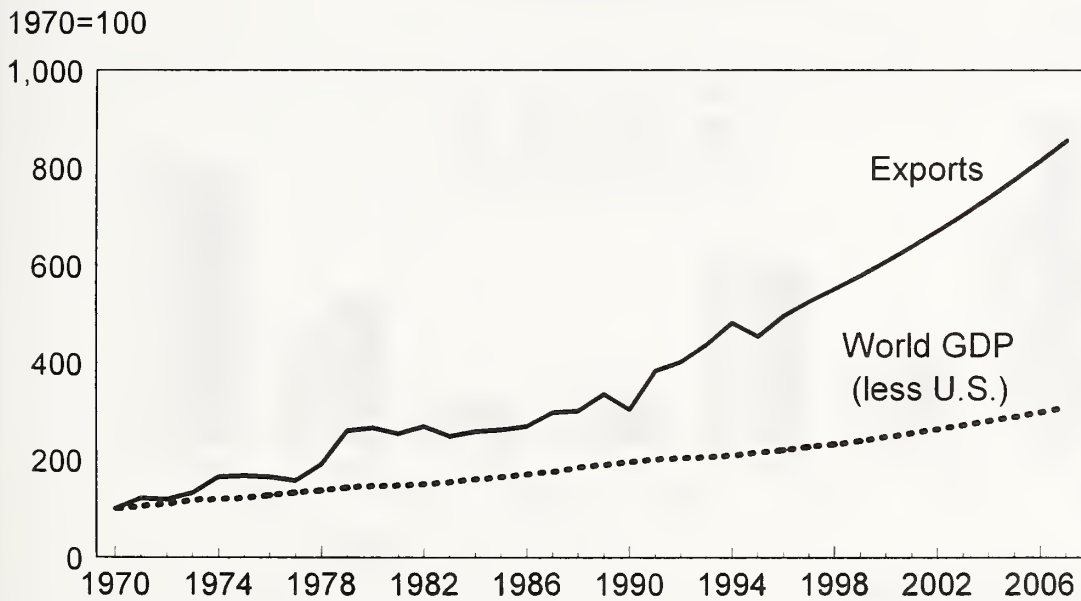
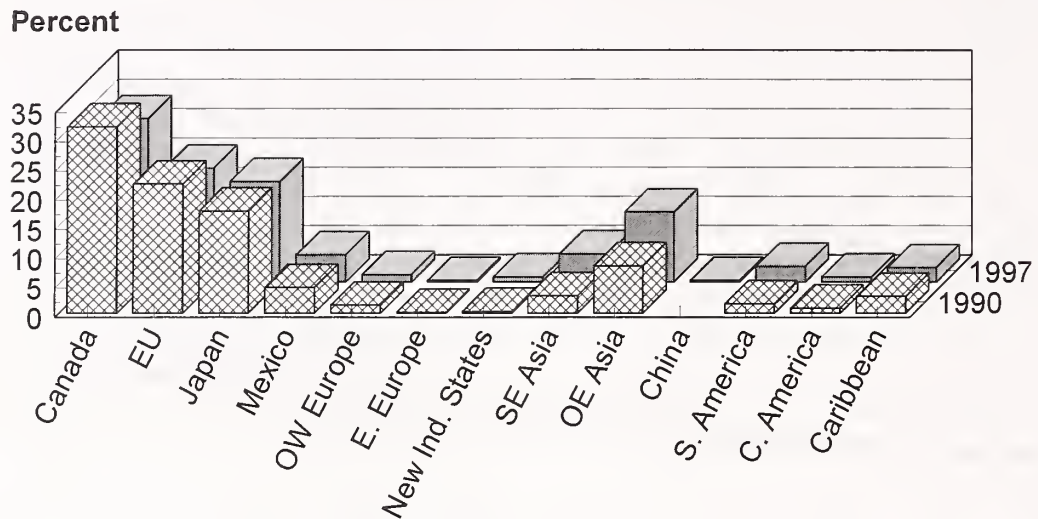


Figure 3.

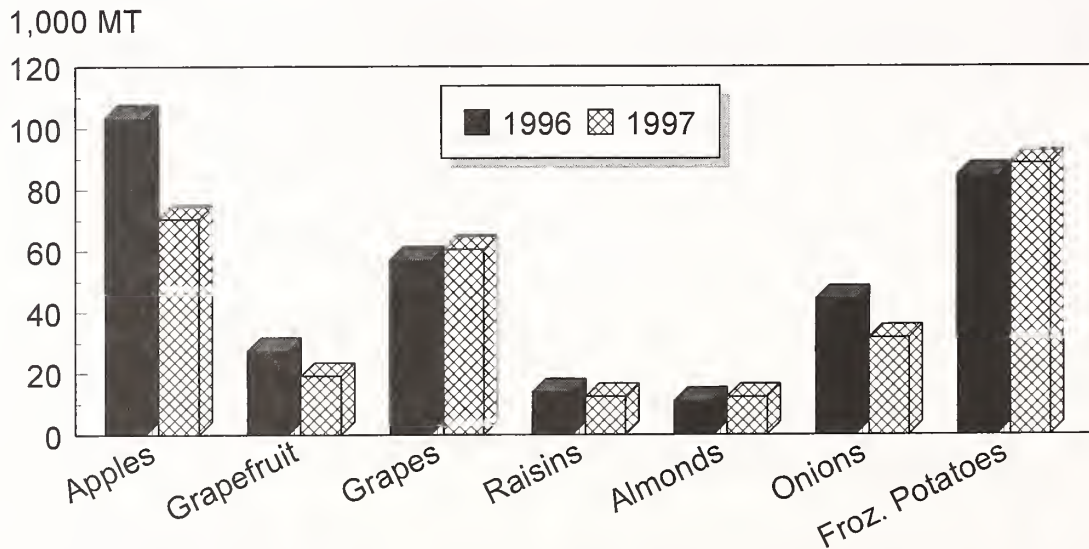
Share of Fruit & Vegetable Exports To Developing Countries Rises



Percent of total fruit and vegetable export value.
Source: Bureau of the Census

Figure 4.

Exports of Selected Fruit & Vegetables to Asian Countries

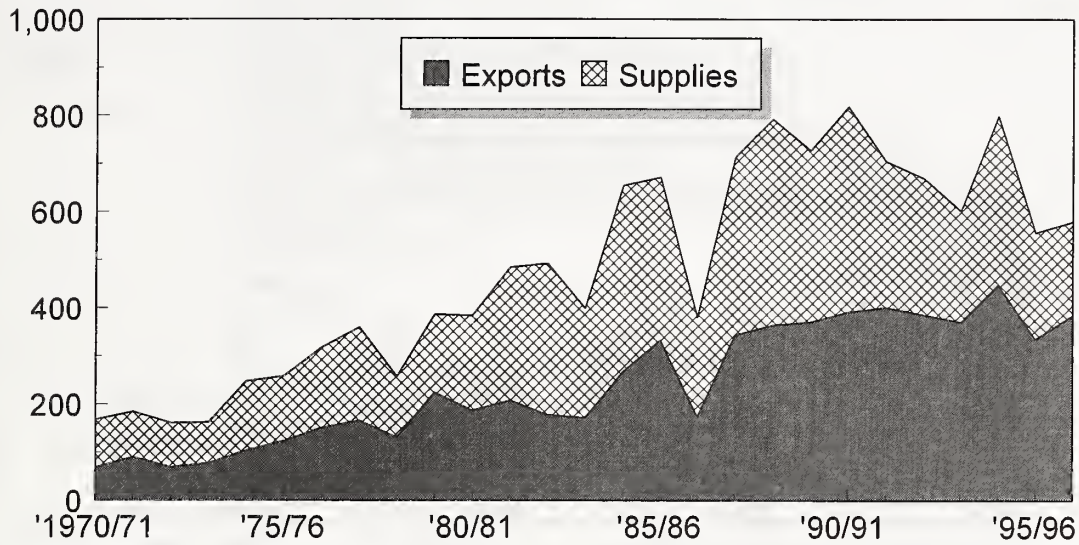


September to November period
Source: Bureau of the Census

Figure 5.

U.S. Almond Exports: A Rising Share of Domestic Supplies

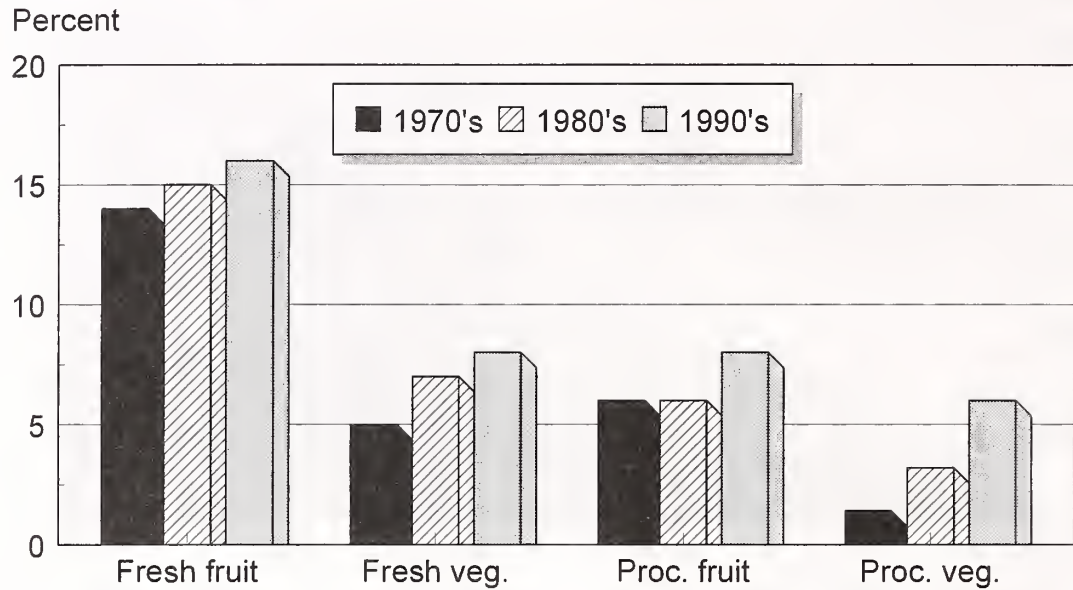
Million pounds



Source: Economic Research Service, USDA.

Figure 6.

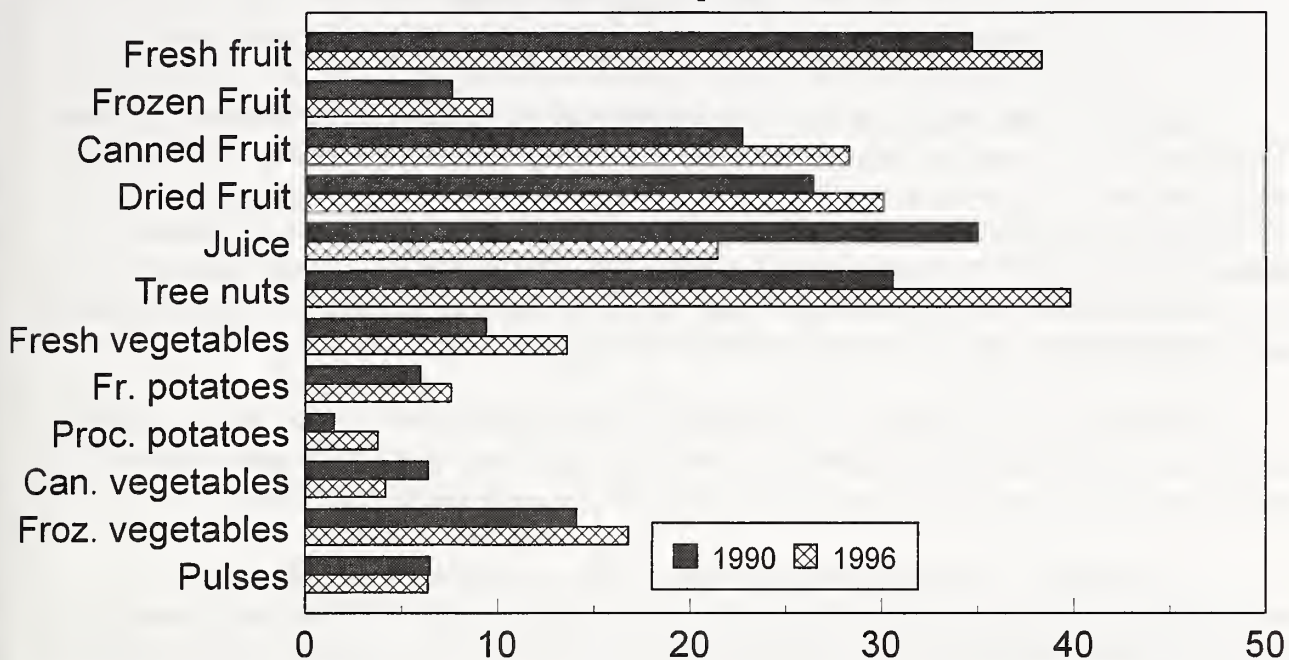
Fresh and Processed Products: Average Export Shares of Domestic Supplies



Source: Economic Research Service, USDA.

Figure 7.

Import Share of Domestic Fruit and Vegetable Consumption



Excluding bananas, fresh fruit import share rose from 12 percent to 15 percent.

Source: Economic Research Service, USDA.

AN FDA FOOD SAFETY PROGRAM - A WESTERN GROWERS' VIEW

Jasper E. Hempel

Vice President, Government Affairs, Western Growers Association

Agriculture has always had a healthy scepticism of government and government agencies. The phrase "We are from government and we're your friends" has always been a coffee shop joke widely guffawed at by farmers across the United States. A farmer's typical view of government is one of enforcement actions, intrusions on personal and property rights, and a notion that farmers are constantly confronted by bureaucrats wanting the farmer to do everything but what the farmer does best: growing food and fiber for an increasingly hungry world. In other words, most farmers believe that government just gets in the way.

Obviously, I have painted an extreme picture; I can also point to many instances where government significantly helps agriculture. Human nature, if not a prevalent media culture, it seems, has us focus on negatives rather than positives, and so it is with food safety.

With respect to food safety and the Food and Drug Administration, our members had developed a negative perception of FDA. I know it sounds funny, but having lived through it for our members I know that typically FDA calls you on a Friday, after 5 p.m., telling you that you have contaminated products, that they want a list of all your customers that they can call to warn them about the contamination, and asking you to recall your contaminated product. In the overwhelming majority of time, you do not have an opportunity to test the alleged contaminated product yourself to verify what government has told you. In the meantime, the damage is done. Your reputation has suffered, your markets have dried up, the media has been notified, and you are in a tailspin trying to contain the crisis.

So, why has Western Growers Association, as well as other commodity organizations around the United States, seemingly bought into the FDA's food safety program if we have had such disdain for them? Why did Western Growers Association and the International Fresh-cut Produce Association develop voluntary food safety guidelines for their members in cooperation with FDA and other government agencies?

There are several reasons for this turnaround:

The Centers for Disease Control's statistics over the past four or five decades reflect that production agriculture and processes related to agricultural production have contributed about 3% to all food borne outbreaks. More than 70% of food borne outbreaks are attributed to post-harvest or post-processing food handling practices. In the last 10 years that 3% has been slowly increasing too now about 7%.

In 1996, there were two E. coli outbreaks that were traced to lettuce. Around the same time, the President announced his Food Safety Initiative, and the California Department of Health Services were making inspections of fresh produce facilities. The media had jumped on

the food safety bandwagon, and increasing focus was given to fresh fruit and vegetable contribution to food borne outbreaks

WGA and IFPA decided to take a proactive stance for their respective membership. With government breathing down our neck, the media calling us, and with some retailers asking for more stringent field practices to protect them against food safety concerns, WGA and IFPA decided to develop voluntary food safety guidelines in cooperation with government! We know our fresh produce is safe. We believe that we have the finest quality of fresh fruits and vegetables grown, shipped and processed of anywhere in the world and we were not afraid to let government see us deal with the issue.

Our belief was this: If we worked with government in producing voluntary food safety guidelines we could accomplish several things. First, we could take a proactive role for our industry. We believe we have an obligation to our consumer customers to provide them the safest, most wholesome and nutritious produce we can produce; second, we could educate regulators about our industry and how safe our product is; third, we could have government oversee our efforts to ensure that we addressed what government is looking at food safety wise; and, fourth, we wanted to avoid mandatory regulations. We truly believed that cooperation in this instance was better than regulation.

So, we developed the guidelines. We formed a steering committee consisting of growers, packers, shippers and processors of fresh produce. These growers, packers, shippers and processors wrote the guidelines themselves, with review by government officials who sat at the table at every meeting we had to discuss the guidelines. We developed a mission statement which focused on minimizing microbial contamination and education. We created subcommittees who took it upon themselves to write the guidelines, and we had a scientific task force, whose job it was to review the work produced to see if it was scientifically sound.

We based the guidelines on the premise that fresh produce is safe to eat. They are also designed to be practical, economical and effective. We wanted them to be a template that others in our industry could use to develop their own guidelines. And, most important, these guidelines are ever-evolving; as new technology, new science, and better food safety processes are developed we will incorporate those developments into future editions of the guidelines. We have also embarked on a strong educational campaign to bring the guidelines to our members. We have held eight workshops around California and Arizona, educating our members about the importance of the guidelines and on the critical need to implement what is contained in the guidelines.

Again, what made our effort truly unique was the fact that we cooperated and partnered with government agencies. State and federal agriculture and health agencies as well as local agricultural officials sat at the table with us. The federal officials who participated were FDA's local representatives. This point is critically important. The local, as in state or county level, officials have a better understanding of our industry than do those individuals who conduct policy work in Washington, D.C. I am not saying this to antagonize anyone, but it is a fact.

The single most important lesson we have learned out of this effort is that we can cooperate with government on food safety or other issues if one takes a "bottom-up" approach rather than a "top-down" mandate. In other words, by sitting together in Salinas, industry and government together developed the excellent guidelines. In contrast, currently FDA is developing top-down industry-wide good agricultural practices (GAPs) which FDA wants United States agriculture to endorse and adopt. While the GAPs are based in part on the guidelines developed by WGA/IFPA and United Fresh Fruit and Vegetable Industry, I do not believe they will receive widespread acceptance precisely because they came from the top as opposed to being developed from the ground up.

Our guidelines addressed every major food safety concerns identified by government regulators. We are implementing them. Based on this cooperative effort between government and industry, our relationship could not be better! We do not hesitate to talk to our local agriculture or health officials about food safety issues; we get them resolved. We are embarking on even more exiting activities in the future because of the strong relationship we have developed with our friends in the regulator community.

In closing, let me say this. We truly appreciate the role that the Food and Drug Administration as well as USDA has taken on food safety. The President's Food Safety Initiative, increased media attention, and several food safety outbreaks attributed to fresh produce spurred our industry into action, working with government to address these issues.

Having successfully worked together on such an important program tells us that we can do so in the future. But, we strongly believe that it will only work if it starts with a bottom up rather than a top down approach. Thank you for your attention.

An Economic Perspective on Food Safety in Fruit and Vegetable Production

Albert Kagan
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Arizona State University

Executive Summary

- Food safety has risen to the forefront as an important policy matter affecting both public health and grower profits.
- Outbreaks of food borne illnesses are typically accompanied by numerous press accounts of the incident, a decrease in demand, and a falling market price. A single outbreak can also have a lasting impact on the market, as the reputation of the industry or product may be damaged in the mind of the consumer.
- A recent NFAPP analysis evaluated the impact of adverse and positive information delivered through print media on California strawberry grower profits over for the period 1994 through 1997. During this time, two food borne illness incidents were experienced in this industry-the cyclospora scare of 1996 and the hepatitis incident of 1997. The observed positive articles may have been the result of the ongoing promotional or defensive efforts of the California Strawberry Commission (CSC)-spin control.
- It was found that adverse information substantially reduces grower profits, but that positive information can partially offset their negative effects. The bad news stories released between 1994 and 1997 caused grower returns to fall by between 37 and 53 million dollars. However, positive news stories allowed growers to recoup between 24 and 32 million dollars. Combined, the net losses to growers over this period ranged between 12 and 21 million dollars.
- Measures to prevent food contamination are costly. Currently these costs are incurred by individuals on a voluntary basis. However, the benefits accrue to many when they help to protect the image of the industry. Thus, individuals have an incentive to under invest in these systems.
- Grower associations, like the CSC, may be well served to redirect funds used traditionally for promotion towards effective industry directed food safety initiatives.

The Economic Value of Spin Control: Food Safety and the Strawberry Case

Food-Borne Illness and Industry Losses

Growers and their commodity associations are fully aware of the nature of the damage that a food borne-illness incident can cause to their industry. However, little is known of the exact cost to producers of such incidents. For example, California strawberry growers, who experienced two such incidents in 1996 and again in 1997, estimated the cost of the latter at some \$40.0 million, but this was admittedly only a rough estimate. Beyond the loss of product that is actually found to be contaminated, the true cost lies in the damage done to a product's reputation with consumers as part of a safe, healthy diet. Such changes in consumers' perceptions may be long lasting, widespread, and very difficult to reverse. Moreover, the damage is often caused by one grower or packer, while all growers are made to suffer.

As growers evaluate the costs and benefits of adopting new production methods and techniques, accurate measures of these costs must be developed in order to be able to quantify the benefit to increased attention to food safety. This information can also be used to quantify the benefits of any defensive action taken by a commodity board, such as the California Strawberry Commission (CSC), in the aftermath of a disease outbreak. To the extent that a product's "clean reputation" is a public good, an analysis of the costs and benefits of trying to fix the damage once it is inflicted provides a measure of the amount that a group of growers, through their association, should be willing to spend on an industry-wide system of contamination control irrespective of any new government regulation.

Procedures for Estimating Grower Losses

The experience of California strawberry growers was analyzed over the period 1994 through 1997. In each incident affecting this industry (the cyclospora scare of 1996 and hepatitis scare of 1997), the potential health hazards associated with consumption of the fruit were chronicled in numerous news articles. The publicity linked to these incidents were observed to cause a decline in market prices, as consumers reduced their consumption of the product (see figure 1). This pattern has been observed in other commodity markets and is consistent with economic theory.

To evaluate the economic impact of these food borne illnesses incidences on growers, the number of negative articles related to strawberries which were indexed in the Dow Jones News Retrieval Service was counted. The impact of positive information was also taken into account and these articles were counted, as well. These information indicators were then introduced into a model of consumer behavior. Other studies have used a similar approach to measure the relationship between egg consumption and information on health and blood cholesterol levels. Parameter estimates from the consumer model were then used to evaluate the independent impact of good and bad news on grower profits, under varying assumptions on the responsiveness of growers in adjusting supplies to

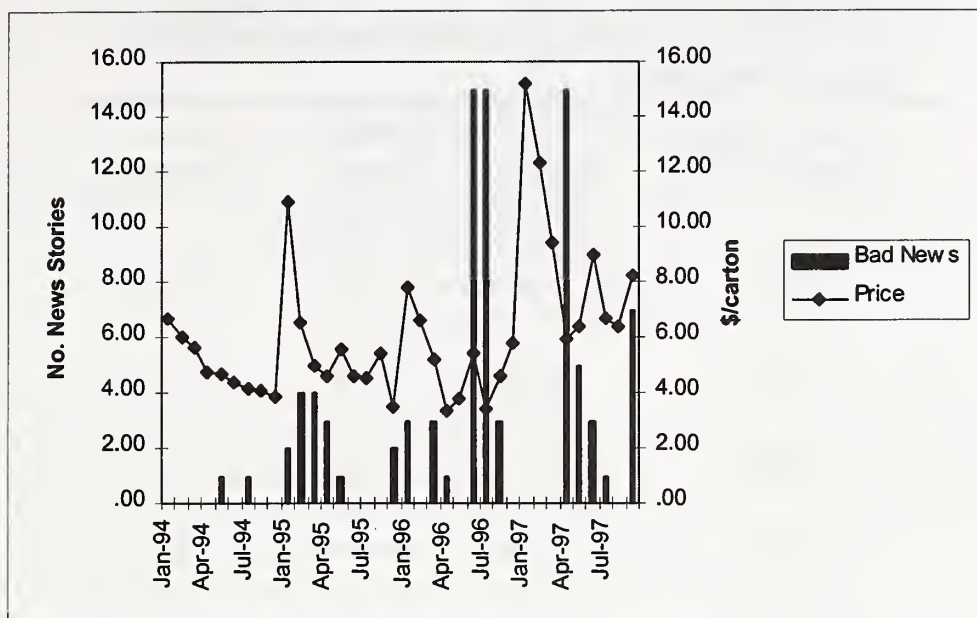


Figure 1. Negative News Stories and Strawberry Prices.

prevailing market conditions. In some instances, such as in the short run, growers have little opportunity to adjust supplies delivered to the market. Over time, grower supply responsiveness (measured by the elasticity of supply) may increase. Their ability to respond, though, can have a little opportunity to adjust supplies delivered to the market. Over time, grower supply responsiveness (measured by the elasticity of supply) may increase. Their ability to respond, though, can have a substantial impact on grower profits. With few prior estimates on the supply responsiveness of strawberry growers available, the impacts of information on grower returns were evaluated under several plausible supply response scenarios. The change in grower returns were calculated for each month during the sample and expressed in November 1997 dollars through a future value calculation.

Findings

The consumer response model showed that bad news has a larger impact on market prices than good news. Over the long run, one additional bad news article causes market prices to decline by \$0.60 per carton, while one additional good news article causes price to only increase by \$0.36. These parameter estimates were next used to evaluate the impact of market information on grower returns.

Assuming that growers are not very responsive in adjusting market supply, the long run grower losses attributable to bad news over the sample period, is estimated at \$53 million (see table 1).

However, if they are indeed very responsive (particularly over the long term), then the losses sum to only \$37 million. Under these same supply assumption, if the effects of good news (defensive actions or spin control) are also accounted for, then grower losses are limited to \$21 million and \$12 million, respectively. Thus, the estimated value of the spin control varies between \$32 million and \$24 million. Provided that the CSC spent less than \$24 million in attempting to offset misinformation or to change consumer perceptions, that money was well invested. However, could it have been better invested?

Table 1. Grower Losses Due to Unfavorable Media and the Value of Media Defense.

Grower Supply Responsiveness	Bad News	With Defense	Value of Defense
<i>\$ Million</i>			
None ($\eta = 0.01$)	-53.07	-21.38	31.69
Minimal ($\eta = 0.10$)	-52.06	-20.80	31.25
Some ($\eta = 0.50$)	-47.95	-18.49	29.46
Moderate ($\eta = 1.00$)	-43.56	-16.07	27.49
Very Responsive ($\eta = 2.00$)	-36.65	-12.41	24.24

All cases represent cumulative cost or benefit of all media exposure from January 1994 to October 1997. The elasticity of supply is denoted by η . Values are in millions of current dollars.

Although it sounds cliché, in this case an ounce of prevention may indeed be worth more than a pound of cure. Preventing a loss this large not just in revenue, but in *profit* provides ample justification for investing in an industry-wide safety-control program. The problem is that a disease-free reputation is a classic example of a public good. Because all growers benefit from this product-image, but none can be compelled to pay their individual benefit, the private market will fail to provide any protection at all. If it is rational for one grower to be a “free-rider,” then it is rational for all to become free-riders. However, commodity organizations were initially established to provide another type of public good--generic commodity promotion. It seems natural, therefore, that commodity groups could treat contamination prevention as an equal and companion objective to promoting their products. Mandatory grower check-off fees would fund inspectors and industry-designed standards that would obviate the need for more government regulation of growers. In the strawberry industry, some of the largest, vertically-integrated grower-marketers have recognized the fundamental truth in this logic by investing in their own Hazard Analysis and Critical Control Point (HACCP) programs. To the extent that their strawberries are seen as close substitutes for all others, however, they are still subject to the risk that one culprit will again damage the buying public’s image of strawberries as a safe and healthy food.

Recommendation

If a product’s image among consumers as a safe and healthy alternative is considered a public good, then grower associations have an incentive to broaden their missions to include not only generic commodity promotion, but also to consider industry-wide efforts at preventing future disease outbreaks. Individual firms’ efforts to develop HACCP programs or to adopt new production practices can be undermined by one individual that takes one risk too many.

Outlook for U.S. Tobacco

Tom Capehart
Agricultural Economist
Economic Research Service
U.S. Department of Agriculture

The outlook for U.S.-grown tobacco in the next 5 to 10 years is pessimistic. Since last year's Outlook Conference, unprecedented events have occurred in the tobacco industry. Foremost among those was the signing of the Global Tobacco Settlement between 40 state attorneys general and cigarette manufacturers in June. State lawsuits have been settled for billions of dollars. In addition to the Global Settlement, numerous bills have been submitted to Congress in the course of negotiating a final agreement. Many of the bills address grower concerns about declining demand for tobacco during the post-settlement era. Some form of tobacco legislation, albeit different from the original Global Settlement, is likely to be passed during the 105th Congress. The outlook for tobacco in the upcoming decade is full of uncertainties due to the fluid legal and regulatory environment the industry faces today. The only certainty is the underlying downward trend in U.S. cigarette consumption will be accelerated.

This paper examines recent trends and the near-term forecast for cigarettes and touches briefly on other tobacco products. Subsequently, the situation and outlook for flue-cured and burley tobacco leaf will be presented. Finally, some of the recent legislative initiatives and their implications for tobacco growers will be discussed.

U.S. Cigarette Output and Consumption, Falling; Exports Uncertain

U.S. cigarette consumption declined an average of about 2 percent annually during the past decade. Social acceptance of cigarette smoking is waning, concerns about smoking and health are increasing, and limits on where smoking is allowed multiply. Although the price cuts of Marlboro Monday and the upsurge of discount cigarette sales tempered price increases during the decade, State taxes rose. In the upcoming decade, cigarette prices will increase. The increases may be policy-driven, either as a result of the Global Settlement or similar legislation, higher taxes, or other forms of legislatively mandated price increases. Alternatively, they could rise because of the costs to the industry of litigation in lieu of a settlement. For whatever reason, rising cigarette prices will continue to dampen cigarette consumption.

In spite of generally declining cigarette consumption, U.S. cigarette output, propelled by exports, reached a record high in 1996. But output declined 4 percent in 1997 and is expected to continue trending downward. After increasing nearly four-fold from 1986 to 1996, cigarette exports probably reached their peak in 1996 and 1997 will commence an era of gradually declining, or at least steady, shipments. Offshore production by U.S. manufacturers contributed the decline in exports, and output, in 1997. Continued disparities between U.S. and world leaf prices, potential

restrictions on cigarette production in the United States, and the possibilities for plant acquisitions and joint ventures overseas are major factors in the movement towards offshore production.

Domestic consumption peaked in 1981 and has been falling nearly every year since. Per capita cigarette consumption based on the 18 and over population group may drop by 83 cigarettes (4 packs of 20 or from 2,482 to 2,399 cigarettes) in 1997. Per capita cigarette consumption in 1988 was 3,103 pieces. Total consumption is expected to be the lowest since 1960.

Despite an increase in the smoking age population, total consumption of cigarettes is likely to decline again during the next decade and per capita consumption is also likely to fall. The major factor in continuing declines will be price. Within the past year the wholesale price of cigarettes increased by \$9.25 per thousand or 19 cents per pack. Federal excise tax increases are set to take effect in 2000 and 2002, adding another \$7.50 per thousand or 15 cents per pack. Although wholesale prices have not reached the levels of the early 1990's, retail prices have risen due to higher State taxes and declining share of discount brand sales. Retail prices of tobacco products were about 5 percent higher at the end of 1997 than the previous year as indicated by the Bureau of Labor Statistics Tobacco CPI.

In 1997, six states raised their excise tax on tobacco products and further increases are set for 1998. Taxes now vary from 2.5 cents per pack in Virginia to \$1.00 in Alaska. Tax discrepancies have become so wide that illegal sales of cigarettes are likely to become a greater problem in the future.

Cigarettes account for most of the tobacco disappearance in the United States and other countries.

However, a \$1.00 to \$1.50 increase in the price of cigarettes is the goal of many of the bills submitted and under consideration in the Senate. Assuming current levels for cigarette exports continue, a one percent increase in the retail price of cigarettes results in a .4-percent decline in quantity consumed, and about a three percent decline in total cigarette output. A one-time \$1.50 per pack increase in the retail price of cigarettes would lower cigarette consumption by 32 percent and lower total output, including exports, by 21 percent. It is likely such a price increase would be phased in over a period of time between three to ten years, but the change in consumption would be essentially the same.

Cigar Consumption Continues Ascent

Consumption of cigars in the United States surged again in 1997 with consumption of large cigars reaching 3.6 billion, 18 percent above 1996. Cigar production surged an estimated 19 percent. As in the past few years, gains have been in the premium segment of the market. Cigar consumption is expected to continue increasing in 1998, although at a slightly slower rate. Consumption of small cigars, those weighing less than 3 pounds per 1,000, in 1997 gained 6 percent, reaching 1.6 billion cigars.

Consumption of Other Products Mixed

Smoking tobacco consumption gained slightly in 1996 reaching 15.3 million pounds, but resumed its decline in 1997, falling to 15.0 million pounds. Snuff consumption will likely increase for 1997, continuing an upward trend that began in the mid-eighties. Chewing tobacco consumption will decline in 1997 and 1998.

U.S. Tobacco Crop Larger in 1997

U. S. leaf production in 1997 advanced 9 percent from 1996. Supplies are down about 2 percent, however, reflecting lower carryin and the shorter than expected burley crop. After rising in 1996/97, total use is expected to increase slightly in 1997/98. Lower carryin stocks offset higher production to lower supplies about 2 percent to 3.7 billion pounds.

In 1997 U.S. growers produced an estimated 1.6 billion pounds of tobacco valued at nearly \$3 billion compared with 1.5 billion pounds valued at 2.9 billion in 1996.

Flue-cured

1997 flue-cured auction sales closed on November 18. Flue-cured marketings were up 13 percent at just over 1 billion pounds. Flue-cured marketings exceeded 1 billion pounds for the first time since 1981. Compared with a year earlier, flue-cured prices fell 11 cents per pound. Flue-cured production rebounded after a weather-plagued season in 1996. Prices averaged \$1.724 per pound, compared with \$1.837 the previous year. Although quality was better, 19 percent of the crop went under loan.

Supplies of flue-cured tobacco are up this year for the second consecutive year but are expected to fall in 1998 due to the 20 percent decline in effective quota, despite higher carryin. Flue-cured supplies represent 2.34 year's use, the highest since 1992. As of January 1, grower cooperatives held about 188 million pounds of flue-cured tobacco (farm sales weight) compared with virtually no holdings a year earlier.

Adequate world and domestic supplies, availability of foreign leaf, and reduced domestic use and cigarette output were reflected in lower prices and increased loan takings. Flue-cured marketings were valued at \$1,749 million, 6 percent lower than 1996.

Burley

As of February 5, the burley crop is 98 percent sold and marketings are 11 percent ahead of 1996 at 605 million pounds.

Burley prices averaged 2 cents per pound lower than 1996. Early wet weather, drought during July and August, and difficult curing conditions plagued the burley crop.

U.S. leaf exports during the past several years advanced due to tighter world supplies and leaf requirements of U.S. manufacturers producing cigarettes overseas. World production is on the rebound however, and abundant global supplies in the upcoming years may result in lower exports. Brazil's recovery after years of below-normal production is a significant factor dampening U.S. leaf exports. Other producers continue to improve quality, enhancing their price-competitiveness. Technological improvements in the manufacturing process continue to reduce leaf and stem use per cigarette and permit greater use of lower-quality leaf.

Supplies of burley in 1997 are expected to increase by 5 percent to 1.5 billion pounds as lower carryin was offset by higher production. For 1997, supply is equal to 2.24 years consumption, down from 1996, reflecting shrinking burley carryin since 1994.

Leaf production in 1998 is likely to decrease, although burley production will rise given good growing conditions. . Manufacturer's purchase intentions for 1998 are down 15 percent for flue-cured and 11 percent for burley. The flue-cured effective quota is down 20 percent while the burley quota is up about 5 percent. Total U.S. carryin in 1998 should be up slightly. The lower flue-cured quota will result in slightly smaller supply in 1998.

For both flue-cured and burley tobacco, legislation requires that the national quota be based on:

- 1) Intended purchases by cigarette manufacturers;
- 2) Average annual exports for the 3 proceeding years;
- 3) The amount of tobacco needed to attain the specified reserve stock level (15 percent of the basic quota).
- 4.) USDA's discretion for setting the quota is limited to no more than 103 percent or less than 97 percent of the amount determined by manufacturer's needs and exports, and the reserve stock level.

Both flue-cured and burley price supports are determined by adjusting the previous year's level by:

- 1.) 5-year moving average of prices (two-thirds weight)
- 2.) Changes in the cost of production index (one-third weight)

Costs include general variable expenditures, but exclude costs of land, quota, risk, overhead, management, marketing contributions, and other costs not directly related to the production of tobacco.

The 1998 flue-cured quota was announced on December 15. The national marketing quota for the 1998 crop is 807.6 million pounds, down from the 1997 quota of 973.8 million pounds. Purchase intentions fell by 81 million pounds, exports gained nearly 29 million, and the reserve stock adjustment was -42 million pounds, reflecting the large quantity of leaf which went under loan in 1997. The USDA used its maximum discretionary adjustment to boost the quota 23.5 million pounds. The 1998 basic quota will decrease about 16.5 percent for each farm. The effective quota is expected to be about 813 million pounds, or 20 percent below 1997. The

support level \$1.628 cents per pound, up 2 cents from 1997. With normal yields, production should approach the effective quota.

The 1998 burley quota was announced on January 30, 1998. The national marketing quota for the 1998 crop is 637.8 million pounds, 10 percent below the 1997 quota of 704.5 million pounds. Purchase intentions were down 53 million pounds from 1997 and exports gained 25 million pounds. There was no discretionary adjustment. The effective quota for the 1998 burley crop is expected to be about 920 million pounds, about 40 million pounds above 1997. The effective quota increased because of low stocks. Price supports are set at \$1.778 per pound, 1.8 cents per pound higher than 1997.

Lower purchase intentions by domestic manufacturers can be attributed in part to the secular decline in cigarette consumption; increased use of foreign leaf in U.S. manufactured cigarettes, and lower cigarette exports. Also, manufacturers are likely anticipating even sharper declines in their leaf needs after the tobacco settlement, or other regulations affecting cigarette manufacturers, are implemented. Since manufacturers store leaf for a number of years, current purchases are affected. This trend is likely to continue.

The Global Tobacco Settlement and Associated Legislative Proposals

Background

Some Congressional action to lower youth smoking will almost certainly occur before the end of 1998 and will have a spillover effect on adult consumption through price increases and restrictions on smoking. Thus the effects on the cigarette industry will be considerable. A retail price increase of \$1.50 per pack over varying periods is frequently referred to as a minimum goal of many proposals. Such an increase could result in about a 32-percent decline in cigarette consumption.

Effects of Cigarette Price Increase on Tobacco Growers

A decline of this magnitude has severe implications for tobacco farmers. Assuming current proportions of cigarettes and leaf exported, a 1-percent decline in demand for cigarettes would result in a .38-percent decline in demand for leaf. A \$1.50 increase in the retail price of cigarettes would cause demand for leaf to fall about 20 to 25 percent. The effects of lower demand are felt twofold: depressed grower cash receipts and in the lower value of the quota owned by growers. Owners of quota who rent or lease it out will also have reduced rental income. These effects will percolate through the communities and regions where tobacco is grown. Although communities will be affected differently depending on other economic activity that might exist, the cumulative effects are significant.

Current Proposals Compensating Tobacco Farmers for Losses

The following proposals have been made to alleviate the economic impacts of declining cigarette consumption on producers and quota owners. These proposals are separate from, but generally

assume, the passage of the global tobacco settlement or similar legislation.

Senators Ford and McCain submitted bills (S1310 and S1414 respectively) which compensating quota owners at a rate of \$4 per pound per year for reductions in quota based on quota owned from 1994 to 1996. Quota lessees would receive \$2 per year with a limit of \$8 per pound on half the base quota. The estimated cost of quota compensation is \$15.8 billion. Economic development grants of \$300 to 500 billion are also provided for tobacco growing regions, at a total cost of \$8.3 billion. Industry workers would receive assistance and higher education grants would be available for tobacco farm families. Total cost of the bill is \$28.5 billion. The tobacco program is left intact.

Senator Lugar's proposal (S1313) terminates the tobacco quotas in 1999 and phases out the price support program in 3 years. Quota owners would receive \$8.00 per pound, while lessees would receive \$1.20 per pound. Tobacco-growing states would receive \$300 million in block grants for agricultural diversification and rural economic development programs. The total cost of the bill is estimated at \$15 billion.

Senator Kennedy's proposal (S 1492) is a comprehensive tobacco manufacturing, marketing, distribution, and public health policy proposal. The tobacco program would continue intact but farmers, quota owners and lessees could sell their quota to the Government at a rate of (\$4.pound for quota owners and lessees). Community economic development block grants are included in the bill. A Trust Fund paid for by higher excise taxes would spend \$13 billion on farmers and rural development.

Senator Hatch (S 1530) has proposed a comprehensive tobacco manufacturing, marketing, distribution, and public health policy proposal. Assistance is available for tobacco farmers, industry workers, and tobacco dependent communities. The tobacco program is terminated; quota owners are offered \$8.00 per pound and lessors are offered \$4.00 per pound. Assistance is available to displaced industry workers, and economic development grants for tobacco dependent communities. Community development and education grants are similar to the Ford bill.

Senator Robb (S 1582) has introduced a bill to compensate quota holders for loss of tobacco quota asset value and privatize the tobacco program. Tobacco growers would receive annual nontransferable tobacco marketing licenses. Current quota owners would be compensated \$8 per pound for lost quota. Transition payments of \$2.00 per pound would be made to lessees and tenants. Block grants for economic development of \$250 million for 5 years are included. Total cost of the bill is \$22.8 billion. Leaf prices would fall by the value of the quota rent rate since licenses would not be transferable.

Senator Conrad's bill (S 1638) is the most recent submission. This bill provides \$10 billion for tobacco farmer compensation and transition assistance for five years, without specifying how the money would be spent.

These proposals affect tobacco producers differently. The following is a rough guide to estimated effects compared with the USDA baseline after 10 years:

The current USDA tobacco baseline projects declines in flue-cured and burley production of about 20 percent, each in the decade following 1997. However, the Global Tobacco Settlement, additional taxes and price increases, and new legislation will affect the baseline

The Ford proposal (LEAF) would result in little change to production levels, and prices, grower revenue or costs of production. Grower incomes would be maintained. Proposals such as the Senators Lugar's and Hatch's would have significant effects on production levels prices by eliminating the tobacco program. Without the tobacco price support and production quota program tobacco production would be unrestricted. Production would increase, prices fall, and less efficient growers would not produce tobacco. Increases in production could be as much as 40 percent compared with continuation of the program. Given declining U.S. consumption, any production increases would likely be exported. The Robb bill would result in little change to production levels or grower welfare. Lower prices resulting from elimination of quota ownership or lease costs would likely cause leaf prices to become more competitive on the world market.

The U.S. tobacco industry is facing unprecedented changes in the next few years. Resolution of the issues raised by the Global Tobacco Settlement will yield a new playing field for the tobacco industry. Increased regulation by the FDA of tobacco products will in a large part determine the rules of play. The 124,000 tobacco farmers who supply the bulk of the tobacco used by the industry will face major challenges no matter which, if any of the grower-related proposals take effect.

FOREIGN TOBACCO OUTLOOK

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U.S. Leaf Exports:

Last year U.S. exports of unmanufactured tobacco totaled 221,510 tons and were valued at over \$1.5 billion. This reflects a slight decrease in export volume but a 12 percent increase in value.

Flue-cured shipments were up 3 percent in volume to over 116,000 tons, and up nearly 6 percent in value at \$832 million. Exports to the European Union, which is our leading export market for flue-cured, were lower in 1997, while shipments to Japan and Turkey were higher.

Burley exports in 1997 were up 9 percent to almost 57,000 tons, and were 20 percent higher in value at \$455 million. Markets which showed growth in 1997 include the EU, although relatively slight, Turkey, Thailand, Malaysia, and the Philippines. Burley markets which showed a decline in trade in 1997 included: Japan and Switzerland.

Looking at some of the other tobacco types. Dark fire-cured, Maryland, and shade leaf wrapper all showed an increase in exports in 1997. Stem exports were down about 27 percent.

U.S. Leaf Imports:

U.S. leaf imports for consumption climbed quite dramatically over the last several years. Imports rose from about 197,000 tons in 1988 to over 460,000 tons in 1993. However, in 1994 and 1995, they plunged by nearly half, but rebounded somewhat in 1996 to around 303,000 tons.

Imports in 1997 were down about 3 percent from 1996 totaling about 294,000 tons, but were up in value nearly 18 percent at \$1.1 billion.

Imports were higher for just about all leaf types in 1997 with the exception of Turkish imports and stems. Flue-cured imports were up 9 percent to nearly 65,000 tons, while burley was up 9 percent to over 61,000 tons.

Taking a quick look at the current status of the Tariff-Rate Quota. Through February 8th, about 29 percent of this year's quota of 151,200 tons has been filled. You can see that the Argentine as well as the residual allocation are nearly full, while the Malawi allocation is about 67 percent full.

World Tobacco Situation:

Brazil:

Brazil's total leaf output is expected to reach about 536,000 tons this year, down 10 percent from last year's 597,000 ton level.

Much of this decline can be attributed to an expected reduction average yields. The 1998 crop has been negatively effected by excessive rains and lower than average temperatures. In addition, hail damage is being reported as being above the historical average.

Yields in the southern region are expected to be about 1,817 kg/ha (1,621 lb/ac), 10 percent lower than last year.

Area planted is forecast to decline slightly but is expected to remain nearly last year at around 324,000 hectares (800,604) acres.

Flue-cured output in 1998 is forecast to decline considerably to around 380,000 tons, down about 11 percent from 1997 when output reached 429,000 tons.

Weather related factors account for this drop as planted area stays near last year.

Brazil's flue-cured exports are expected to decline to near 230,000 tons, 6 percent lower than last year. Lower leaf availability is being given as the main reason for this decline.

Burley output is forecast to decline 10 percent, reaching about 90,000 tons. Burley exports are forecast to reach 40,000 tons, 9 percent lower than in 1997.

Argentina:

Argentina's leaf output is forecast to total slightly over 129,000 tons this year, up 5 percent from 1997.

We recently revised out forecast for 1998. Originally we had production climbing to nearly 143,000 tons, with flue-cured reaching 88,000 tons, and burley increase 24 percent to over 44,500 tons. However, extreme weather conditions due to El Nino have caused us to revise our production forecast.

Most of the revision is with burley tobacco, particularly in the state of Misiones. This is where the weather has caused the most problems. Heavy rains from October through December have caused considerable plant loss estimated at nearly 30 percent. The burley crop in Tucuman has not been impacted as much. However, some loss has been reported.

Leaf quality, however, is reported to be good.

We are now estimating that the 1998 flue-cured crop will total about 87,000 tons, up about 15 percent, while burley output will come in at about 35,000 tons, down about 4 percent from last year.

Flue-cured plantings are up about 13 percent, and burley is up about 14 percent on account of favorable grower returns in 1997. Grower prices are expected to be close to last year's level for burley, but prices for flue-cured are expected to be lower.

There still exist some uncertainty over the Special Tobacco Fund and how proposed changes in this fund will impact production. The STF continues to pay for about 30-40 percent of the grower price. However, there is quite a bit of pressure to change this program. We suspect that over the next several year STF assistance is likely to decline and result in lower Argentine grower prices and lower grower returns.

Total leaf exports this year are expected to reach 56,000 tons, down about 6 percent from 1997. We originally had exports reaching a record high in 1998, but with the weather problems we are now expecting exports to be down somewhat.

Flue-cured exports are forecast at 40,000 tons, about 2,000 tons less than in 1997, while burley is forecast at 14,000, down about 1,000 tons from last year.

China:

China's tobacco production is forecast to total over 2.7 million tons in 1998, about 22 percent lower than in 1997.

In past years we say planted area to tobacco grow fairly steadily since farmers were able to make more money with tobacco than many other crops. However, the tobacco monopoly is working to discourage the production of lower quality tobaccos.

In July, the Chinese Government passed new regulations to control total tobacco plantings. The State Tobacco Monopoly Administration reported that under the new regulations leaf production in 1998 will fall nearly 40 percent to 1.7 million tons.

In the past, however, it has been difficult for the Central Government to make sizable cuts in tobacco production since it's production is a major source for tax revenue for the provinces. That is why our estimate shows a 20 percent decline the first year.

The new regulation will give the Central Government better control of tobacco production through the issuance of permits to grow tobacco and by requiring plans for the amount of land planted to tobacco be approved by the Central Government.

Under the new regulations, planted area to tobacco in 1998 is expected to fall nearly 25 percent to 1.5 million hectares.

China has made advances in recent years as a significant leaf tobacco exporting nation. However, after rising to nearly 74,000 tons in 1994, exports have fallen off, but rose to 85,000 tons in 1997.

Exports are forecast to reach about 100,000 tons in 1998, and China has a goal of exports by the year 2000 of 150,000 to 200,000 tons.

Zimbabwe:

Zimbabwe's area planted to flue-cured has steadily increased over the last 5 years. And for 1998, planted area is again expected to rise reaching 97,000 hectares, about 4,000 hectares more than last year.

Zimbabwe's flue-cured production target for 1998 has been set at 220,000 tons, 18 percent more than last year. Production in 1997 reached slightly over 187,000 tons.

Losses last year were above average due to adverse weather conditions and some problems with mold.

These factors along with sufficient world flue-cured stocks pushed prices lower in 1997. Prices received last year averaged US\$2.33 per kilogram, down from US\$2.94 in 1996.

Given better weather conditions this year, yields, crop quality and prices are expected to improve in 1998.

Rainy conditions over the last two years have provided sufficient water reserves and should more than account for any dry weather conditions which occur on account of El Nino.

Flue-cured exports in 1998 are expected to increase to nearly 187,000 tons, an increase of 9 percent from 1997.

Malawi

Malawi's burley output is forecast to reach 146,000 metric tons in 1998, up 9 percent from last year when production reached almost 134,000 tons.

Increased output by smallholder growers has had a direct impact on Malawi's burley output over the last 3 years.

It is estimated that over 150,000 smallholders grow tobacco in Malawi with a combined total output of nearly 50,000 tons. The size of the smallholder operation generally averages about ½ an acre.

In addition to the smallholders, there are about 45,000 small and large estates involved in tobacco production in Malawi.

Improved export prospects are also expected to push output higher this year.

Exports are vital to Malawi's tobacco industry with nearly 95 percent of the tobacco crop going into the export market, and nearly 70 percent of the country's foreign exchange earnings being generated by tobacco trade.

Malawi's burley exports are expected to reach about 85,000 tons in 1998, up 6 percent from 1997. The leading export markets for Malawi's leaf include Europe, Asia and the United States.

Farm Level Effects of an Increase in Federal Cigarette Taxes under Two Scenarios: Keep vs. Eliminate the Tobacco Program

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Prospects of Congress passing some form of the proposed tobacco settlement are diminishing rapidly. In lieu of the proposed settlement many close to the legislative process think that the federal excise tax on cigarettes may be increased substantially, perhaps by as much as \$1.50 per pack. Should such a large increase in cigarette taxes occur, what would be the effect at the farm level? Obviously if the cigarette tax increase results in a decline in US cigarette consumption, demand for US burley and flue-cured tobacco will be adversely impacted. Under the current tobacco program this decline in US cigarette consumption would be reflected in lower marketing quotas and a consequent decline in farm revenues from tobacco. Tobacco growers and quota owners are seeking compensation for damages from any comprehensive tobacco legislation such a settlement or tax increase. Senator Richard Lugar introduced a bill in the fall of 1997 that would provide compensation, but would also eliminate the tobacco program. A second question is then what might be the farm level effects of simultaneously increasing the federal excise tax on cigarettes and eliminating the tobacco program?

Effects of a cigarette tax increase under the current tobacco program

Tables 1 and 3 give the potential long-term effects of a \$1.50 per pack increase in the federal excise tax on cigarettes on annual use of US flue-cured and burley tobacco if the current tobacco program remains intact. Price remains at its current level in this scenario since the tobacco program maintains a floor under market prices by increasing or decreasing the marketing quotas in response to changes in demand. Total annual sales quantities of flue-cured tobacco would be expected to decline between 9 and 19 percent. Total annual sales quantities of burley tobacco would be expected to decline between 11 and 23 percent. All of the decline would result from decline in purchases of US tobacco by US cigarette manufacturers of between 15 and 33 percent. Unmanufactured exports of US tobacco would be unaffected by the tax increase since the price of US tobacco would not change under the current tobacco program.

Tables 2 and 4 give the potential effects of a \$1.50 per pack tax increase on farm revenues from tobacco and income from ownership of quota under the current tobacco program. As with annual sales quantities, gross farm revenues from tobacco sales would fall between 9 and 19 percent for flue-cured tobacco and between 11 and 23 percent for burley tobacco. Quota income on a pound of tobacco is the difference between the price received for the tobacco and the total economic cost of producing a pound of tobacco (less the cost of quota). Since the tobacco program elevates the price of US tobacco in the world market by restricting production and sales of US tobacco via the marketing quotas, quota is an income producing asset. Under the current tobacco program, a \$1.50 per pack increase in cigarette taxes would be expected to reduce income from

program, a \$1.50 per pack increase in cigarette taxes would be expected to reduce income from quota by 2 to 6 percent in the case of flue-cured tobacco, but no reduction is expected in the case of burley. The reason quota declines less than gross revenues and sales quantities is that the annual return per pound of quota increases as quota declines and becomes scarcer.

Effects of a cigarette tax increase and elimination of the tobacco program

Tables 5 and 6 show the potential long term effects of both increasing the federal cigarette tax by \$1.50 per pack and eliminating the current tobacco program. Since the primary mode of operation of the tobacco is to restrict the amount of tobacco that can be grown and sold, elimination of the marketing quota system will result in an overall expansion of tobacco production and a reduction in the farm price of tobacco. After an adjustment period, price per pound would likely fall over 25 percent in the case of flue-cured tobacco and over 20 percent in the case of burley tobacco. Total US production of flue-cured tobacco would expand between 20 and 75 percent, with the most likely scenario being expansion of 40 to 50 percent. Whether or not US burley tobacco would expand or contract is difficult to predict. Forecasts of percentage changes in the quantity of burley tobacco produced range from a decline in production of 14 percent to an increase in production of 7 percent.

Table 7 shows the potential changes in gross farm revenues from tobacco sales for burley and flue-cured tobacco. Forecasts of changes in gross revenues from the sale of flue-cured tobacco range from - 4 percent to + 29 percent. Gross revenues from the sale of burley tobacco would decline between 20 and 30 percent. With the elimination of the tobacco program, all quota income would be transferred to cigarette manufacturers or smokers via lower tobacco prices. As a result the value of quota as an asset would fall zero.

Some of the most dramatic changes with elimination of the tobacco program would be changes in location of tobacco production and changes in numbers of tobacco farmers. Burley production would exit the Appalachian region due to high production costs, but could expand in central Kentucky and central Tennessee. Burley expansion in central Kentucky and Tennessee could be limited if the piedmont of North Carolina and Virginia began producing burley tobacco instead of flue-cured. Flue-cured production would decline in the piedmont of North Carolina and Virginia, but expand in the coastal plain of North and South Carolina, as well as in south Georgia and north Florida. While highly uncertain, tobacco production could expand to areas not currently producing tobacco. The current tobacco program limits consolidation of farms and tends to preserve small farms because quota (and thus tobacco production) can not be sold or rented across county lines (Tennessee is the exception). Elimination of the tobacco program would result in much greater consolidation of tobacco farms and a large net exit of tobacco farmers despite a possible expansion of overall production. The reduction in number of farms would be particularly notable in regions where farm size is smallest, such as the Appalachian region in burley production and the piedmont of North Carolina and Virginia in flue-cured production.

Table 1. Flue-Cured Tobacco Price and Annual Use in Response to a \$1.50 per Pack Increase in Cigarette Price Under Current Tobacco Program

	Price \$/lb	Annual Total Disappearance	Domestic Disappearance	Unmanufactured Exports
Initial Levels	\$1.73	890	510	380
Best Case	\$1.73	813	434	380
Worst Case	\$1.73	723	343	380

Table 2. Effects on Flue-Cured Tobacco Sales, Annual per Pound Return to Quota, and Income from Quota of a \$1.50 per Pack Increase in Cigarette Prices Under the Current Tobacco Program

	Tobacco Sales (million \$)	Annual Return to Quota	Income from Quota (million \$)
Initial Levels	1540	\$0.40 /lb	356
Best Case	1406	\$0.43 /lb	349
Worst Case	1250	\$0.46 /lb	334

Table 3. Burley Tobacco Price and Annual Use in Response to a \$1.50 per Pack Increase in Cigarette Price Under Current Tobacco Program

	Price \$/lb	Annual Total Disappearance	Domestic Disappearance	Unmanufactured Exports
Initial Levels	\$1.85	583	409	174
Best Case	\$1.85	522	348	174
Worst Case	\$1.85	449	275	174

Table 4. Effect on Burley Tobacco Sales, Annual per Pound Return to Quota, and Income from Quota of a \$1.50 per Pack Increase in Cigarette Price Under the Current Tobacco Program

	Tobacco Sales (million \$)	Annual Return to Quota	Income from Quota (million \$)
Initial Levels	1079	\$0.30 /lb	175
Best Case	965	\$0.34 lb	179
Worst Case	830	\$0.39 lb	175

Table 5. Flue-Cured Price and Annual Disappearance After a \$1.50 per Pack Increase in Cigarette Price and Elimination of the Tobacco Program

	Price	Annual Total Sales Quantity	Domestic Use	Exports
(million lbs)				
Initial	\$1.73	890	510	380
After Deregulation	\$1.30 to \$1.25	1,083 to 1,588	420 to 580	663 to 1,008

Table 6. Burley Price and Annual Disappearance After a \$1.50 per Pack Increase In Cigarette Price and Elimination of the Tobacco Program

	Price	Annual Total Sales Quantity	Domestic Use	Exports
(million lbs)				
Initial	\$1.85	583	409	174
After Deregulation	\$1.50 to \$1.40	503 to 622	280 to 358	223 to 264

Table 7. Effect on Tobacco Sales, Annual Per Pound Return to Quota, and Income from Quota of a \$1.50 per Pack Increase in Cigarette Prices With Elimination of the Tobacco Program

	Flue-Cured Tobacco Sales	Burley Tobacco Sales
(million \$)		
Initial Levels	1,540	1,079
After Tax and Deregulation	1,480 to 1,985	755 to 871

ENVIRONMENTAL QUALITY, ENVIRONMENTAL REGULATION AND THE STRUCTURE OF ANIMAL AGRICULTURE

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To analyze whether or not environmental regulations impact the structure of animal agriculture, it is first necessary to ask "what is meant by structure?" Numerous definitions of structure exist and are commonly used to analyze dramatic changes occurring in the animal agriculture subsectors. These changes, and therefore the term structure, may refer to such factors as the distribution of sales, revenues, and profits; the importance of farm income as the primary family income source; concentration of production within a geographic region or by a small number of firms; degree of specialization; ownership and control of inputs and outputs; and the number and size distribution of farms (Offutt, Hoppe et al.). While each of these factors helps to evaluate changes occurring in the animal agriculture subsectors, we suggest that the crux of the economic and social debate surrounding environmental regulations and the structure of industrialized animal agriculture centers around three factors: changes in the size of operations, changes in the form of vertical coordination, and shifts in the location of animal agriculture. To that end, we ask the question "have environmental regulations impacted these three factors?" Furthermore, we look beyond the current structure and address the question "might environmental regulations affect the future structure of animal agriculture?"

Because we focus on three specific factors to describe structure, it is worthwhile to define what we mean by each. First, we propose that the structure of animal agriculture can be characterized by the size of the operation. In this sense, we are referring to the physical size of the operation defined by the number of head or acres of land, rather than defined by gross revenues or farm income. We choose to do so because we believe the social and environmental issues associated with animal agriculture are the result of the number of animals per associated land base, rather than the dollar value attached to any farm operation. In the case of animal agriculture, issues associated with the size of the operation are closely linked to the issue of animal density, here defined as the number of animals per unit of land. To a large degree, the increase in animal density has been the result of increased specialization and changes in the type of vertical coordination.

Second, we use the term form of vertical coordination to describe changes in the type of coordinating mechanism at various stages of input supply, production and marketing.

coordinating mechanism at various stages of input supply, production and marketing. Characterizing vertical coordination as a spectrum, with cash or spot markets on the far left and complete ownership integration at the right, changes in the way that farmers and farms operate can be identified. As an illustration, one can think of a hog farmer who raises his own corn which he then feeds to his hogs and, in turn, markets the hogs at the local livestock auction. In this case, the farmer is his own feed supplier (ownership integrated between these two stages), but markets his hogs as a blind cash transaction. Alternatively, one could think of a contract pork producer who in return for a predetermined contractual fee, raises hogs owned by another party, the contractor. The contract producer provides his own land and facilities but has feed delivered to his farm by the contractor and is not involved in any marketing decisions. This scenario illustrates a case where neither spot markets (a loosely-coordinated system) nor complete ownership integration (a tightly-coordinated system) occurs, but rather the form of vertical coordination, production contracting, falls elsewhere in the spectrum. We raise the issue of form of vertical coordination, because we believe, like size of operation, it is at the base of discussions involving the structure of animal agriculture.

Finally we focus on the issue of location of animal agriculture. Locational changes in animal agriculture are characterized by two different types of adjustments: a) shifts of animal production between regions and b) clustering of production within a region. We focus on these two phenomena because we believe that environmental problems, both real and perceived, attributed to animal production arise from characteristics of and changes in not only how but where production takes place.

Have Environmental Regulations Impacted the Structure of Animal Agriculture?

We address this question by analyzing the effect of environmental regulations on each of the three factors used to describe the structure of animal agriculture.

Size

To begin, we raise the question of whether or not environmental regulations have impacted the size, and more specifically the movement toward larger size, of livestock and poultry farms. We conclude the answer is ambiguous and there is evidence that environmental regulations have both facilitated and hampered the movement toward larger farms.

The greatest factor driving the movement toward larger farm size has been the introduction and adoption of new technologies, that for the most part, have not been scale neutral. Improved disease control and feed programs, coupled with the movement toward confined production operations and greater fixed investments, have led producers to increase output, lower per unit costs of production, and adjust to new sources of risk. Evaluating pork production, Good determined that hog production costs for a large, specialized farm in North Carolina were approximately 10% less than for a traditional hog farm in the Midwest. Without any significant change in overall supply, early adopters of new technologies which lower per unit costs are able to enjoy positive economic profits. As first adopters of new technologies expand production, the inevitable outcome will be an increase in overall supply leading to a decrease in market price. Therefore, marginal producers are forced to either adopt low-cost technologies, exit from the industry, or search for alternative production and marketing relationships that lower the cost of production. Harrington and Reinsel emphasize that differences in production technologies due to the adoption of technological

innovations and form of vertical coordination are the driving force behind the increasing size of farms.

Recognizing that technological change has been the primary driving force toward larger farm size, what role has environmental regulation played in changing farm size? In states such as Minnesota, South Dakota, and Nebraska, where regulations require balancing manure nutrient applications to nutrient use by crops, farms are required to own or acquire the rights to apply manure on farmland. This has the potential to increase production costs as external costs of manure management are internalized. As herd size increases, diseconomies in manure management exist when land application at an agronomic rate is required (Martin and Zering; Hoag and Roka; Northrop and Zering). These diseconomies are primarily the result of transport and application costs and are further exaggerated when the land base is constrained. Should these diseconomies represent a significant portion of production cost, we would expect to see a movement toward smaller farms rather than larger farms, or at a minimum, a decrease in the acceleration of the movement toward large farms with a high level of animal density.

In contrast to the diseconomies associated with nutrient balancing, in states where environmental regulations reach beyond this to include permitting, certification, storage, treatment or management standards, the high fixed costs of complying with such regulatory requirements are more easily met by farms with high animal numbers (Davis et al., Bennett and Osburn). Because no immediate payoffs occur to offset upfront compliance costs, large farms are better positioned to spread these costs over a greater number of production animals. When these requirements are applied to all sizes of farms, the relative cost of compliance is much greater for small farms than for large farms. Therefore, if technological benefits and the costs of compliance favor larger farms, we would anticipate a movement toward larger farms.

Despite the evidence of differences in compliance costs for large and small animal operations, there has yet to be any empirical evidence that these cost differences have, in fact, been a significant cause of farm size changes. Empirical evidence exists that economies of scale and size in production are factors which are contributing to changes in farm size. However, no one to date has attempted to separate out, empirically, the relative importance of the myriad of factors contributing to the observed transition to larger farms.

Vertical Coordination

The movement toward larger farms with higher animal densities has been combined with changes in the type of coordinating mechanism used by input suppliers, farmers and packer/processors. A growing body of literature exists, both empirical and theoretical, as to why certain forms of vertical coordination occur. Within this literature, there is a general consensus that several key factors are involved in the movement from spot markets to more tightly-coordinated forms of vertical coordination such as production contracts and large-scale ownership integration.¹ These factors include reduced transaction costs, increased responsiveness to consumer demand, improved quality control (e.g., food safety, consistency, and uniformity), risk shifting and risk

¹While recognizing that there are many forms of vertical coordination along the spectrum (e.g., cooperatives, alliances, marketing contracts), for purposes of this discussion, we choose to focus on the movement towards production contracts and large-scale ownership integration.

reduction, and production efficiencies from specialization. In addition, for many young farmers, pork production contracts have been viewed as a means to get started in farming and obtain easier access to capital (Rhodes and Grimes). It is not unheard of for lenders to offer 100% financing to pork producers who hold only a hog finishing contract as collateral.

Recognizing that there is a trend toward more tightly-vertically coordinated animal agriculture systems, what then is the relationship between environmental regulations and vertical coordination? First, as the use of production contracts increases, concerns arise over the fact that contractors control feed and animals, but manure handling costs are borne by contract growers. However, as evidenced by the actions of one major North Carolina contractor who reportedly pulled hogs from a contract grower's facilities overnight after the grower was cited for not being in compliance with environmental regulations, contractors are highly motivated to meet and in some instances exceed environmental regulations (Martin and Zering). Conversely, contractors are less motivated to include feed additives, such as phytase which has the potential to reduce the amount of phosphorus excreted by broilers and swine, when such additives increase feed cost to the contractor.

Proposed federal legislation aims to make animal owners, regardless of whether or not these individuals are physically involved with day-to-day animal care and husbandry, responsible for manure management. An unanticipated but potential implication of such legislation may be a movement toward large-scale ownership integration. Contractors would reduce environmental risks by acquiring more land and directly controlling land application. Consequently, by increasing the level of integration, contractors internalize environmental risk rather than leave them in the hands of contract growers who may not comply or would require significant monitoring.

Second, an alternative viewpoint suggests that environmental regulations may impact the movement toward production contracts rather than large-scale ownership integration as a form of vertical coordination. Gillespie, Karantinis and Storey found that environmental mandates affecting the Quebec hog industry encouraged integrators to discontinue expansion by ownership integration and to return to production contracting. The impetus for this was the requirement that producers own enough land on which to spread manure at acceptable rates. Without the ability to contract with producers, particularly at the finishing phase where the greatest volume of swine manure is generated, integrators would be required to own the land, thereby increasing their capital investment.

A final issue governing the relationship between environmental regulations and vertical coordination is the movement toward more specialized livestock and poultry farms. As farms have moved away from their traditional base as diversified animal-feed operations and toward more specialized livestock and poultry farms, environmental concerns arise due to the increase in animal density without a coinciding increase in the availability of cropland for manure application. Increased specialization is particularly apparent in the broiler chicken industry where production contracts are the dominant form of vertical coordination accounting for roughly 90% of production. In the pork industry, where production contracts account for approximately 25% of total hog inventory, contracting accentuates the limited land base under a farmer's control. Because feed is not provided by the contract grower, the contract grower does not necessarily own

or control the acreage necessary to apply increasing volumes of manure nutrients. However, here regional differences are quite acute. Whereas contract hog farms in North Carolina tend to be less than 100 acres with high animal-to-land ratios, a recent survey of pork producers in Michigan showed that over two-thirds of the responding contract growers were also significant cash crop farmers (Martin). Similarly, growth in contract pork production in the Oklahoma and Texas Panhandles has been facilitated by the large land base available to balance manure nutrients with crop utilization.

In general, we conclude that there is conflicting evidence as to what role environmental regulations have played in the form of vertical coordination. Certainly, there is a movement away from spot markets to a more tightly-coordinated industry structure. However, a myriad of factors, including transactions costs, risk, consumer demands, and reduced production costs resulting from specialization, has facilitated the transition.

Before moving to issues of location, the role of state-level anticorporate farming laws and their impact on structure merits discussion. At least nine Midwestern states prohibit corporations from owning farmland or farm operations.² Krause argues that the intent of anticorporate legislation is to "exclude large outside agribusinesses and conglomerates from direct production and from controlling farm production (Krause, as reported in Knoeber)." Knoeber suggests that corporations are singled out because of their size, rather than the particular form of business organization. However, by limiting the organizational structure of farming and therefore the form of vertical coordination, these states make social and economic choices to limit the choice of coordinating mechanisms available to farmers and the livestock and poultry subsectors. By doing so, producers are constrained to operate in a different business environment relative to their counterparts in other states. Of the nine states with explicit anticorporate farming laws, only three, Minnesota, Oklahoma, and Missouri, have experienced a growth in total hog inventories over the last 10 years. Smith and Kuch raise the question of whether environmental regulation "may be used as an additional barrier against entry of industrialized operations [p.1246]." Certainly, the existence of anticorporate farming laws is likely as important as, if not more important than, environmental regulation in affecting locational changes in an industry becoming more tightly coordinated.

Location

Have environmental regulations influenced changes in location, either between or within regions, of animal production? Consider first changes in location between regions. That industries move to areas which offer a lax environmental regulatory environment is a common conjecture. In a recent survey article, Jaffe et al. examined the "widespread belief that environmental regulations have a significant effect on the siting of new plants in the United States [p. 148]."³ Their review

²Exceptions and exemptions to the bans are found in most state laws. For instance, most states allow family farm corporations or limited liability corporations. Some allow certain types of corporations to engage in farming activities, but place restrictions on the number of shareholders and/or the residencies of the shareholders. In addition, others permit authorized farm corporations.

³Jaffe et al. reviewed research addressing manufacturing firms rather than natural resource-based industries (such as agriculture) because 1) "that's where the research is [p.136]" and 2) because of their wish to

of the research evidence indicated that such concerns “may not be well-founded [p.148].” Anecdotal evidence suggests that such concerns also may not be well-founded in agriculture. In her review of changes in the dairy industry, Purvis explains:

“Texas dairy producers resent the sweeping generalization that they fled California’s stringent environmental laws, seeking a more laissez-faire situation in the Texas of the early 1980s. They moved to Texas seeking inexpensive land, low-cost feedstuffs, and proximity both to a dairy service infrastructure (such as veterinarians and nutritionists) and to urban amenities (the Dallas-Fort Worth metroplex) [p.24].”

Other evidence exists to suggest that regional changes in the location of animal production do not correlate with the existence of lax environmental regulations. Using indicators of states’ commitment to and institutional capability for environmental protection programs, Lester classified states according to their likelihood to implement environmental regulations. According to his classification, the environmentally progressive states (CA, FL, MD, MA, MI, NJ, NY, OR, WA, and WI) are those judged to have both a strong commitment to and the institutional capability for environmental protection. The “strugglers” (CN, DE, HI, ID, IA, ME, MN, MT, NC, ND, NH, NV, RI and VT) are states that have the commitment, but lack institutional capability and/or resources. The “delayers” (AL, AK, AR, GA, IL, LA, MO, OH, OK, PA, SC, TN, TX, VA and WV) are those states that have the institutional capabilities for but a weak commitment to environmental protection and are therefore likely to maintain the status quo. The environmentally regressive states (AZ, KY, KS, MS, NE, NM, SD, UT and WY) have neither the commitment nor the institutional capabilities to pursue environmental protection (Lester).

In Figure 1, each state’s classification is overlaid with statistics indicating the change in the state’s relative rank in pork production. Figure 1 illustrates that both increases and decreases in relative ranks have occurred in states with similar environmental classifications. Although this does not rule out the possibility of environmental regulations impacting changes in the location of animal agriculture, it does suggest that there are other forces, such as clustering and agglomeration economies, driving the shifts.⁴

Clustering in animal agriculture arises from production facilities locating in close proximity to one another within a given region (Pagano and Abdalla). Clustering is a cumulative phenomenon. The establishment of a processing facility, for example, draws increasing numbers of producers. Once sited, producers tend to adopt production and manure management technologies to achieve improvements in economies of size, adding animals to generate revenue to pay for such technological improvements. In addition, new entrants are attracted by the positive economic dynamics of a well-established cluster and its allied agribusinesses, and greater production volume from existing production facilities and new entrants triggers expansion in processing capacity (Norris and Thurow).

examine the issue of “flight” of industries in the manufacturing sector from the U.S. to other countries.

⁴Regional shifts of similar magnitude have been observed in the cattle feeding, broiler and dairy industries.

The development of a cluster of beef feedlots in the High Plains during the 1970s and 1980s has been attributed to proximity to feed-grain supplies and large slaughter plants, a favorable climate, readily available supplies of feeder cattle, and proximity to southern and western markets for processed beef (Dietrich et al.). Construction of feed mills and poultry processing facilities in eastern Oklahoma resulted in a significant regional growth in broiler production. Growth in eastern North Carolina's hog industry, spurred by investments on the part of three major integrators, in turn led to the construction of a packing facility in neighboring Bladen County, thereby strengthening the incentives to further increase production in that region.

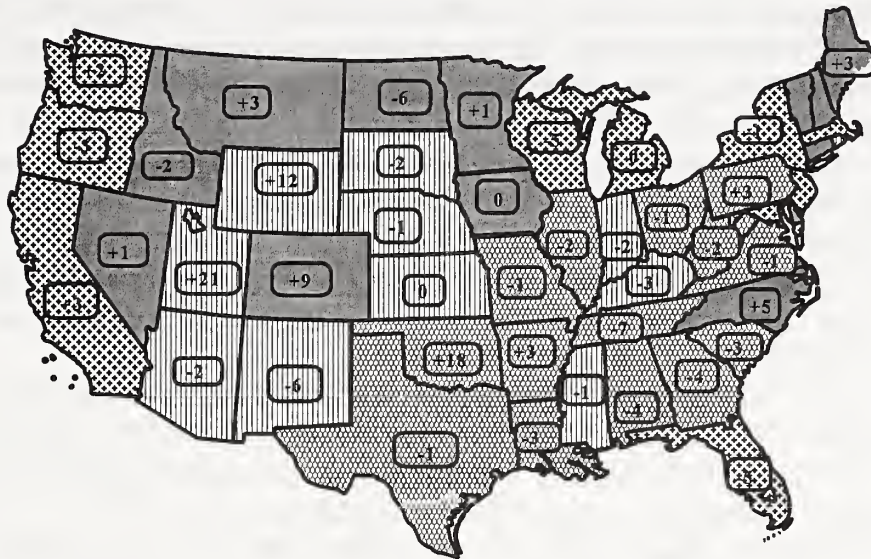
It is the clustering phenomenon that has, more often than not, triggered changes in environmental regulations. States which have recently passed laws focusing on manure management are responding to significant growth in animal numbers and clustering and to resulting concerns about animal densities, nutrient balances, and water and air quality. However, regulations requiring stringent manure management are less likely to affect where livestock operations are sited than how they are managed. Instead, it appears that local land use policy is playing a significant role in livestock siting decisions. Localities in Minnesota and Michigan are using zoning authority to guide, and often limit, the siting of new and/or expanding livestock operations. While evidence about the rationality of zoning decisions is mixed, it appears that local zoning boards are attempting to consider not only environmental concerns (e.g., prevention of water quality problems) but also social and quality of life concerns (proximity of operations to public facilities, residential areas, etc.).

Conclusions





We believe it is an oversimplification to state that environmental regulations have significantly impacted the structure of animal agriculture. Moreover, we suggest that changes in farm size, form of vertical coordination and location of animal agriculture are, themselves, the cause of changes in environmental regulations. The driving force behind these changes is a myriad of economic, social and environmental factors.

Technological change has been the greatest driving force in changing farm size, but the impact of this change is intertwined with a host of influences. Production contracts and large-scale ownership integration have changed the face of American agriculture by impacting the economic and social status quo. As animal industries continue to evolve, public policies, including environmental regulations, will have the potential to impact industry structure. The cost of environmental compliance has the potential to impact farm size, coordination mechanism and location of animal agriculture. However, as more states institute manure management standards, expect climatic and geologic factors to be more important influences on structure than environmental regulations per se. Climatic and geographic factors, which vary widely, make it much less costly to comply with environmental regulations in some regions than in others, so state and federal standards for manure management may cause larger shifts between regions. Local land use policies will likely affect location in terms of how they address the clustering phenomenon. In short, empirical research is needed to determine the magnitude and direction of impact of these contemporaneous economic, social, and environmental forces on the changing structure of animal agriculture.

Figure 1. States' Likelihood to Pursue Environmental Protection and
States' Change in Relative Rank



Lester's (1994) classification of states' likelihood to implement stringent environmental regulations:

-  = environmentally progressive states
-  = "strugglers"
-  = "delayers"
-  = environmentally regressive states

Number indicates the change in the state's relative rank between 1985 and 1997, based on December 1 Hog Inventory, USDA.

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U.S. Sugar Outlook

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Agricultural Economist, USDA

Ladies and gentlemen, it is a pleasure and a privilege to present an outlook on the prospects for the U.S. sugar industry. In the last 10 years, the sugar industry has expanded considerably, both on the production and consumption sides. I would like to present a view of both the near-term outlook, and 9 years into the future.

The Near Term Outlook: U.S. Sugar Production

In spring 1997, there were hopes for a 1997/98 (October 1 1997 - September 30, 1998) beet sugar crop that might challenge the record 1994/95 output of 4.5 million tons raw value. Acreage was up about 100,000 acres, and growing conditions for the country proceeded reasonably well through the summer. USDA's initial forecast for 1997/98, 4.3 million tons, was raised to 4.4 million tons in November due to an increase in the projected sugarbeet crop from National Agricultural Statistics Service (NASS). In January, the forecast sugarbeet crop was lowered, in part due to disease and pest problems in the western plains and also to slightly lower acreage harvested and yield. U.S. beet sugar production was lowered in the January WASDE report to 4.3 million tons, and kept at that level in February.

USDA is forecasting the volume of sugar produced from the desugaring of molasses in 1997/98 will be 234,000 tons. The implied recovery rate of sugar produced directly from beets is 13.6 percent (4.06 million tons of sugar from 29.9 million tons of beets). If sugar from molasses were included, the recovery rate would be 14.4 percent.

Cane sugar production in 1997/98 is forecast at 3.555 million tons. For now USDA is maintaining production in Hawaii at 340,000 tons, but future developments would more likely lower that forecast than raise it. Louisiana came in with not only a record crop, but beat the record by more than 200,000 tons or 20 percent. The seven percent rise in sugar per acre above the previous record was mostly due to a higher-yielding new variety of cane, combined with good weather.

The season in Texas is over, with production a disappointing 80,000 tons due to lack of adequate irrigation, the lowest since the freeze of 1989. Some fields were abandoned. Texas has suffered through 5 years of drought, and even El Nino has not brought relief. However, prospects are for higher acreage next year, as some farmers are switching land and/or water out of cotton into cane.

The final Florida production story is not yet written, as the season is only three-fourths over. For a while a record-setting season seemed a good prospect, and USDA's current forecast is for

1.835 million tons, which would be about equal to the record output of 1991/92. There has been a great deal of rain in the last month, which complicates harvest but does not necessarily impact final output. Acreage in Florida has been relatively stable for the last 8 years, after an earlier period of rapid growth. Puerto Rico is projected to produce 25,000 tons.

The U.S. cane sugar production forecast, if achieved, would be a record. The forecast total U.S. sugar production would be higher than all years except 1994/95.

U.S. Sugar Deliveries

USDA is forecasting an increase in sugar deliveries (a proxy for consumption) of 1.85 percent over the 1996/97 level of 9.769 million short tons, raw value. Note that the USDA data on deliveries include several categories which are not included in the private-sector deliveries with which some of you may be familiar: direct-consumption imports, Puerto Rico, deliveries from sugarcane processors, deliveries under the import program for polyhydric alcohol, and, more recently, imported sugar syrups. The rise of 180,000 tons would be slightly above the 12-year trend increase of 160,000 tons.

Since September we have been including the product entered under tariff code 1702.90.4000 in the supply and use balance. We are working on obtaining better information on this product.

Americans seem to continue to increase their per-capita use of sucrose, and HFCS use is growing faster than that of sugar. The “fear of fat”, although often honored in the breach (at least by folks like me), may still hold sway with a sizeable segment of the population and thus contribute to higher intake of carbohydrates (sugars).

Imports

The tariff-rate quota tranche cancellation in January dropped the estimate of imports under the tariff-rate quota (TRQ) to 1.74 million short tons, raw value. This compares to TRQ imports of over 2.2 million tons for each of the last two fiscal years. Other than those two years, the last time annual fiscal year TRQ imports exceeded 2 million tons was 1990/91.

Imports of sugar under the reexport program are forecast at a relatively-low 275,000 tons, and exports at 185,000 tons for the refined sugar reexport program and 100,000 tons as transfers to the sugar-containing product reexport program. The lack of a good premium for white sugar on the world market and the lack of a consistent discount for forward contracts on the world sugar futures markets have reduced interest in this program. It remains to be seen what will transpire later in the year, when a new refinery in Florida comes on line raises U.S. refining capacity and thus the need for other refiners to take more advantage the reexport programs to utilize capacity.

Prices

Refined sugar prices are reported in recent months at 25.5 cents a pound for beet sugar, fob Midwest factories. The beet crop appears to be about 300,000 tons higher than last year, and the

correlation of softer prices with larger beet crops has held again. The near-by raw sugar price (Contract No. 14, New York Coffee Sugar & Cocoa Exchange) has been below 22 cents a pound for weeks, and averaged 21.85 cents in January and 21.93 cents in December. The late-summer futures prices have recently been around 22.10 - 22.20 cents. The projected ending stocks-to-use ratio is 13.5 percent, and based on experience of the last 15 years that stock-to-use ratio correlates with a July-September price in the range of 23 cents. Is there something happening this year affecting (shifting) that relationship? What will structural changes in the industry do to this relationship?

Spot prices for HFCS-42 were reported at about 10.5 cents a pound, dry basis, for 1997, compared with about 14.5 cents in 1996, and 15.5 cents in 1995. Relatively low HFCS prices in 1997 may have caused some users to switch from sugar to HFCS. If true, will there be a continuation of that phenomenon in 1998? The possibility of substitution of HFCS for sugar is low, perhaps too low to detect in our numbers: but yet, HFCS deliveries continue to grow at more than twice as fast as sugar deliveries. The recently-announced temporary reduction in use of some HFCS production facilities may provide a bit of lift to HFCS prices in the near term.

Longer-Run Projections

The USDA baseline is not the same thing as a forecast. Baseline projections are provided as a conditional long-run scenario about what would be expected to happen under current agricultural law, and with specific assumptions about external conditions. Critical assumptions are made about U.S. and foreign policies, U.S. and external macroeconomic conditions, growth rates of agricultural productivity, and normal (average) weather. The sugar baseline shows USDA's view as of November 1997.

Beet sugar production seems likely to grow in the years ahead. The number of beet factories declined in most of the decades this century, while beet sugar production continued to rise. For example, using averages for a decades, in the 1950s there were 64 sugarbeet factories producing about 1.8 million tons of beet sugar. Since then, the number of factories has dropped while average beet sugar production increased, although beet sugar output in the 1980s averaged about 3.5 million tons, similar to the 1970s. For the 1990s, beet sugar production has averaged about 4 million tons for the decade so far.

What will the next decade bring? I suspect a continuation of recent trends: fewer, larger factories, and more beet sugar: perhaps 5 fewer factories, but beet sugar production approaching 5 million tons a year.

Since the yield of sugarbeets per acre has not shown any upward trend, the key for better sugar per acre has been in the quality of the beets, and in the ability of the factory to extract more of the sugar in the beets. There are no technical reasons of which I am aware for these trends to slow down. In fact, the transgenic plant revolution has barely begun, and continued progress in finding ways to improve sugarbeets is likely. At the same time, some of the new technologies may lower costs: for example, new sugarbeet varieties which are resistant to broad-spectrum herbicides may be able to cut costs by \$50 or more per acre. Of course, at least in the early years

of the patents, some of the savings may be partially offset by higher seed costs, but in the longer run significant costs reductions are possible.

While sugarbeet yields per acre do not show a trend, the recovery of sugar from beets (not including sugar from de-sugaring of molasses) shows a trend increase since 1970 of about 0.05 percent a year, although the time trend explains only about 25 percent of the variation. The USDA baseline projects beet sugar production to rise above 5 million tons by the year 2007.

Overall U.S. cane sugar production seems also set to increase. This past year's remarkable Louisiana crop may become the norm, or even be exceeded in the future. In the prime growing areas of Louisiana, there are few alternative crops, and none for which returns per acre can match cane. The price-cost squeeze continues to press upon many growers. On the other hand, efficiencies are gained with new cane varieties, harvesting machines, and organizational changes which will lead to fewer and better factories.

Florida may continue to face various pressures, including from environmental concerns. One Florida mill and associated acreage has been bought by the government, with an agreement to continue to produce sugar for 5 more years. However, as some land is taken out of cane, it is possible that partial offsetting expansion in other areas could occur. Florida has some of the largest mills in the world, but the pressure to grow even bigger to remain on the cutting edge of efficiency will likely continue. On balance, Florida sugar production is projected to not change much over the next 9 years. Hawaii is projected to stabilize slightly below current production levels, assuming that current companies remain in business (standard baseline assumptions). Texas should recover back to their peak production levels of a few years ago.

The long-run growth rate of U.S. sugar consumption is projected at 1.2 percent a year, slightly below the last decade, but above population growth of about 0.8 percent. Over the 9-year period to 2007, total consumption would rise by over 1 million tons.

Projecting sugar consumption has at times been a treacherous business. To illustrate, I show a chart plotting various projections made over the last decade. The projection is for U.S. sugar consumption in the current year, 1997/98. In the 1988, 1989 and 1990 baselines (made in November of each year), total U.S. sugar consumption for 1997/98 was projected at about 8.8 million tons. As it turns out, we will exceed that level by over 1 million tons.

Or, consider that sugar consumption in 1991, just 2 years after the 1989 forecast, already exceeded the projection for 9 years later in the year 2000. Some of you who were involved in the 1990 Farm Bill debate may recall similar numbers, and the influence they may have had in shaping the marketing allotment and minimum import provisions of that legislation.

Why was the projection of 9 years ago off by 1 million tons? Is it possible that the current projection for 2006/07 will be off by 1 million tons? If so, will it be higher, or lower? Of course, if we knew the answers then our projection would take them in to account: recklessly, I offer some observations about sugar consumption anyway.

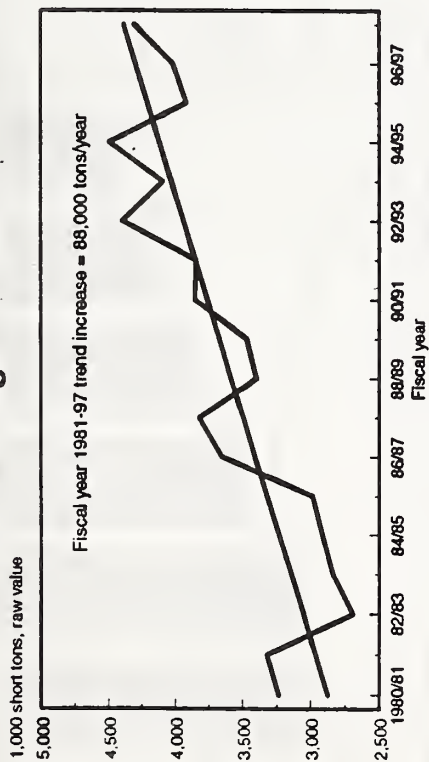
Sugar at one time had a rather negative public image, if I remember the 1970s correctly. Then in the 1980s, public attention became focused on fat as something to avoid; and about the same time a rather successful advertising campaign to promote the healthy and natural aspects of sugar was conducted. The result: gains to carbohydrates, and sugar in particular. Such gains, due to the movement away from fat, may be exhausted. If true, this contribution to the growth in sugar consumption may be over.

U.S. income has grown over the last decade, although many debate whether there was an even distribution of income growth. The correlation of sugar consumption to income was complicated during the era of HFCS substitution, but certainly there is no reason to assume anything but a positive correlation, even if small. With continued growth of income assumed in the baseline, the impact of income over the next decade should not be very different from the past decade.

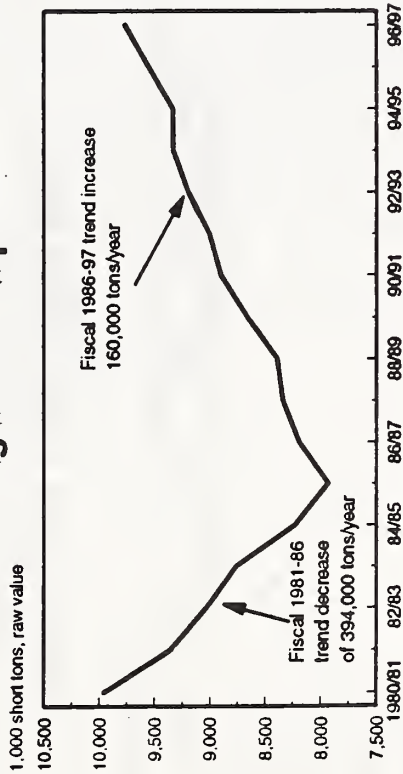
Sugar has never lost much market share to high-intensity sweeteners, though some have predicted this result. There is contrary evidence, that high-intensity sweeteners may have encouraged sugar consumption. Mr. Consumer may convince himself that, since he is consuming a diet soft drink, he can eat another donut. I think that this effect was real, but may have run out of steam. The number of alternative sweeteners on the shelf will grow. While a low-calorie perfect bulking agent may not be here yet, some progress may be made in this area. Clever technicians will figure out more ways to combine sweeteners and bulking agents. High-intensity (low-calorie) sweetener prices are only likely to continue to fall, particularly when new ones appear. Bottom line: sugar will be faced with more competition from low-calorie sweetener in the future than it has in the past.

Putting it all together, the USDA baseline indicates that U.S. sugar consumption growth, even at 1.2 percent a year, out paces production growth, and import needs rise, though not dramatically. Notice, however, that it would not take a very large deviation in either the production or consumption line away from its projected path to make a significant change in import requirements.

U.S. Beet Sugar Production

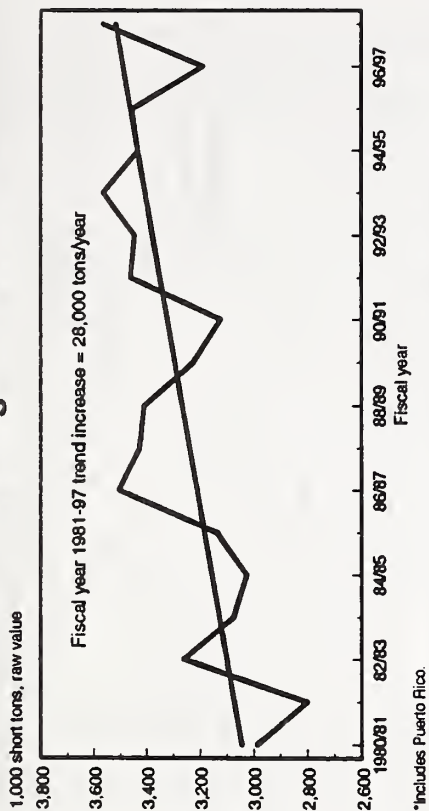


U.S. Sugar Consumption

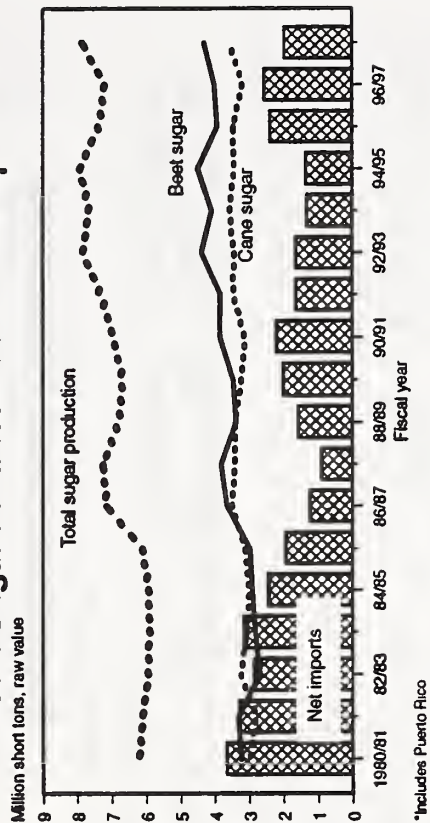


Source: USDA

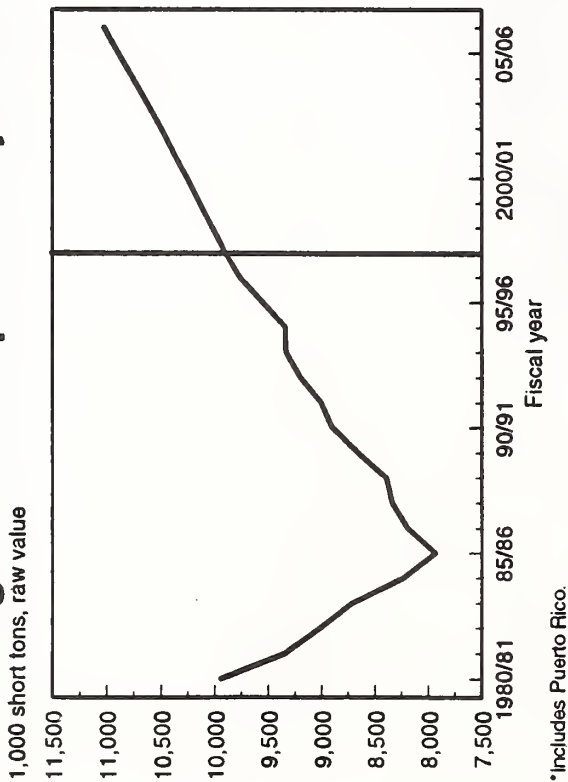
U.S. Cane Sugar Production*



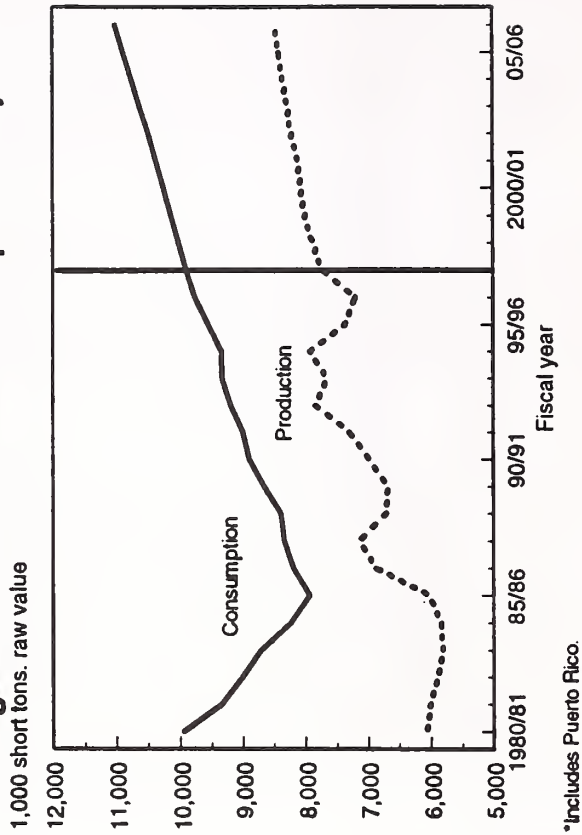
U.S. Sugar Production and Net Imports



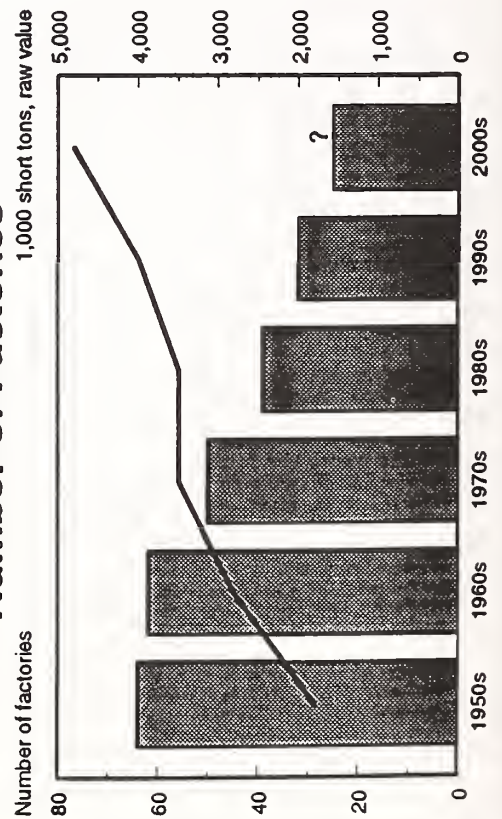
U.S. Sugar Consumption Projection*



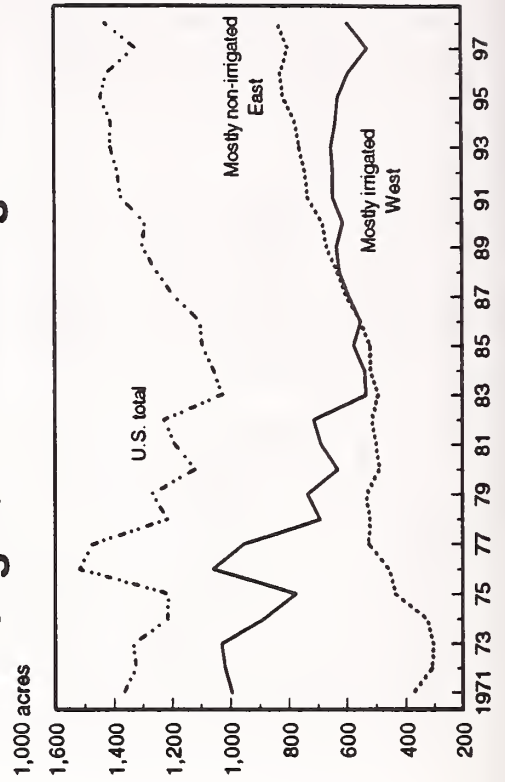
U.S. Sugar Production and Consumption Projections*



Beet Sugar Production and Number of Factories

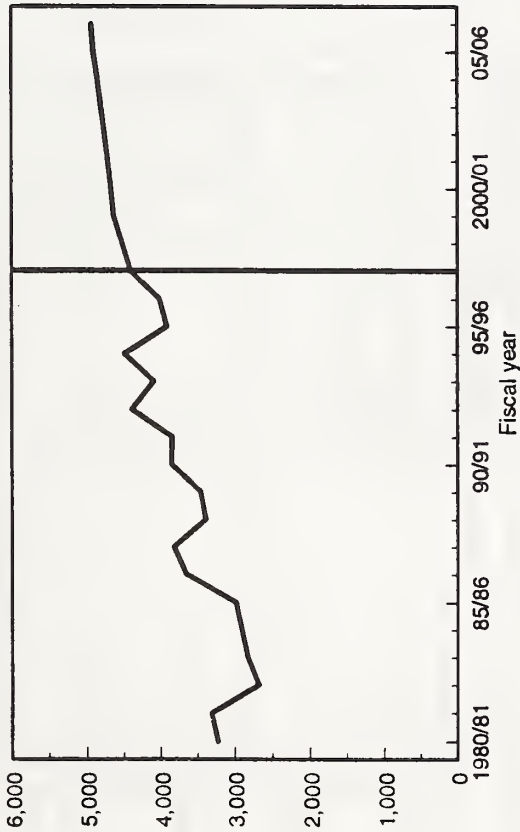


Sugarbeet Area Harvested Irrigated vs. Non-Irrigated



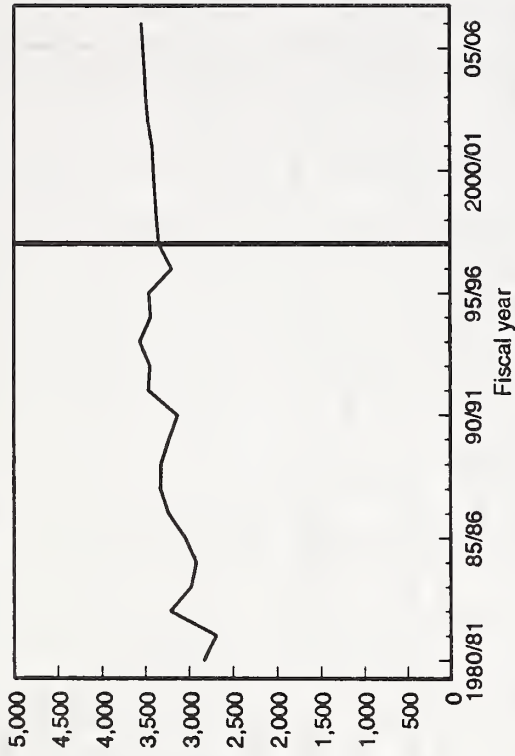
U.S. Beet Sugar Production Projection

1,000 short tons, raw value



U.S. Cane Sugar Production Projection*

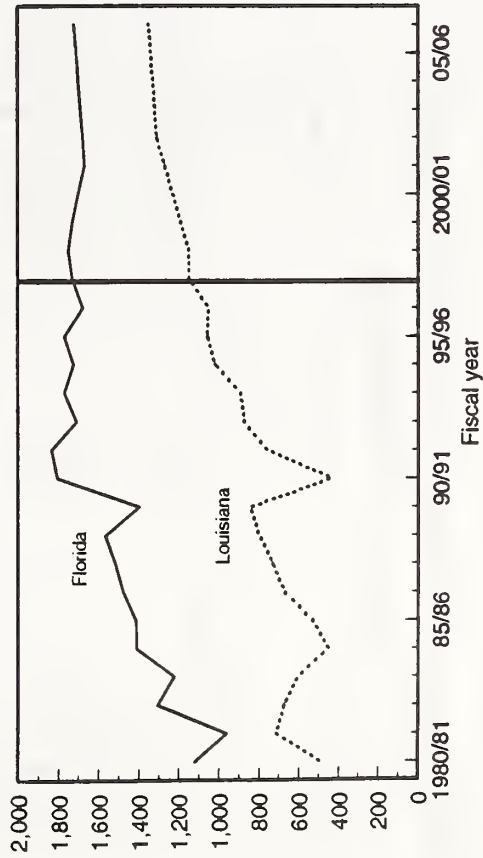
1,000 short tons, raw value



*Includes Puerto Rico.

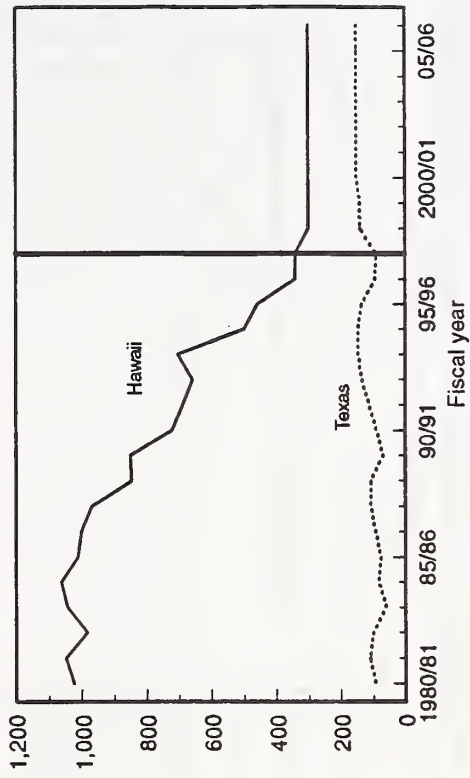
Florida and Louisiana Cane Sugar Production Projections

1,000 short tons, raw value

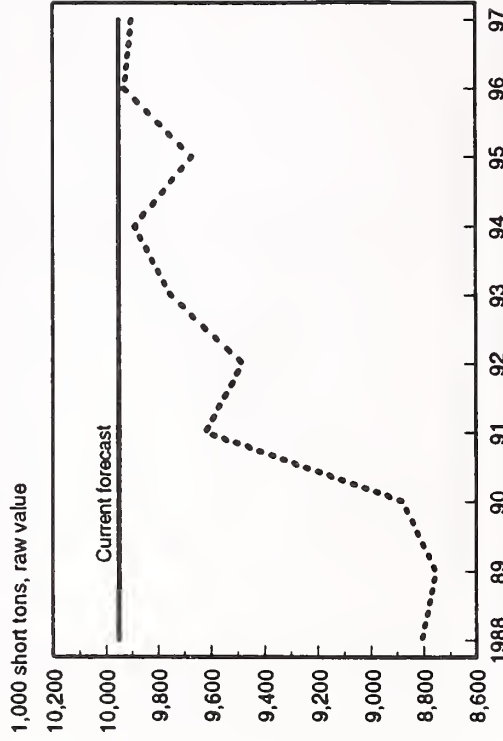


Hawaii and Texas Cane Sugar Production Projections

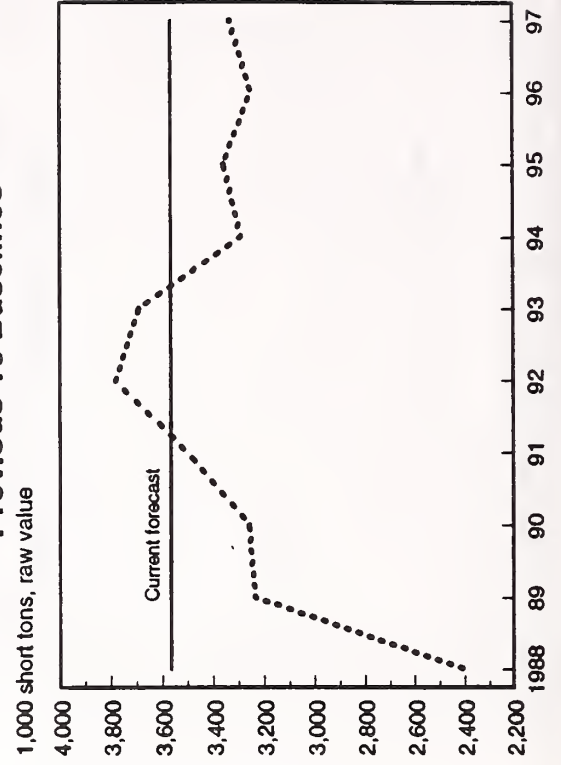
1,000 short tons, raw value



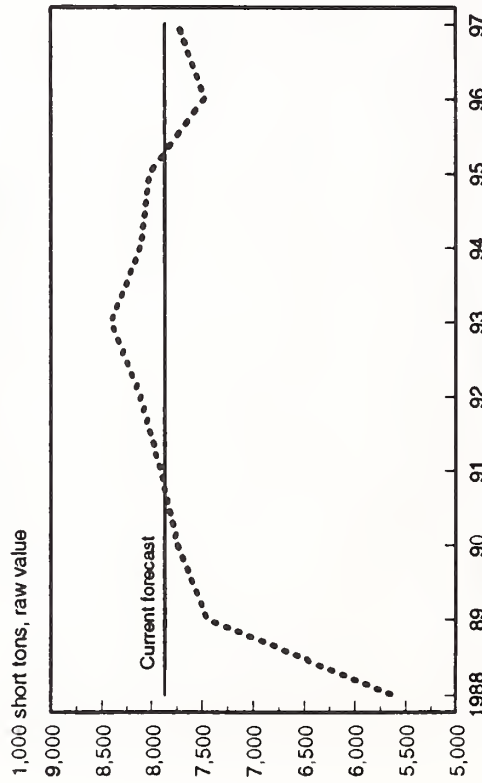
Projection of 1997/98 U.S. Sugar Consumption
Previous 10 Baselines



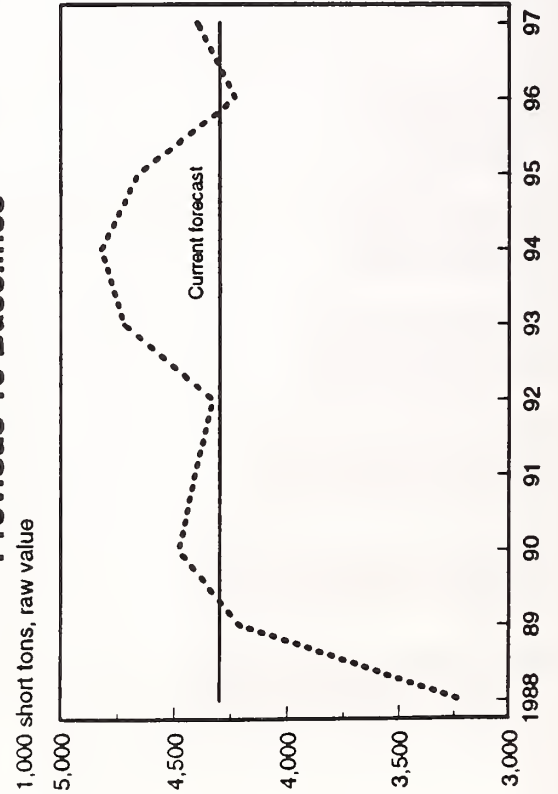
Projection of 1997/98 U.S. Cane Sugar Production
Previous 10 Baselines



Projection of 1997/98 U.S. Sugar Production
Previous 10 Baselines



Projection of 1997/98 U.S. Beet Sugar Production
Previous 10 Baselines



U.S. Sugar: Supply, disappearance, and prices, fiscal years 1/

Item	Units	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
Supply:																
Sugarbeets-Planted	1000 Acres	1,231	1,252	1,054	1,081	1,124	1,125	1,232	1,267	1,327	1,324	1,400	1,427	1,437	1,438	1,476
Harvested	1000 Acres	1,190	1,228	1,027	1,056	1,096	1,103	1,191	1,252	1,301	1,295	1,377	1,387	1,412	1,409	1,443
Yield	Tons/Acre	19.8	22.4	20.3	19.9	20.2	20.4	21.1	22.4	19.1	19.4	20.0	20.3	20.6	18.6	22.1
Production	Mil. S. Tons	23.5	27.5	20.9	21.0	22.1	22.5	25.2	28.1	24.8	25.1	27.5	28.2	29.1	26.2	31.9
Sugarcane-Harvested	1000 Acres	684	716	700	733	701	723	751	778	794	849	771	887	909	927	907
Yield	Tons/Acre	37.4	36.6	40.6	37.1	37.1	37.2	38.5	36.0	35.9	34.0	35.6	33.6	32.7	32.7	33.0
Production	Mil. S. Tons	25.6	26.2	28.4	27.2	26.0	26.9	28.9	28.0	28.5	28.8	27.4	29.8	29.7	30.3	30.0
Supply:																
Beginning Stocks	1000 S. Tons	1,741	1,645	1,673	1,419	1,624	1,772	1,670	1,508	1,326	1,244	1,224	1,524	1,477	1,704	1,337
Production	1000 S. Tons	6,219	6,121	6,004	5,909	5,939	6,124	6,981	7,247	6,804	6,691	6,978	7,306	7,838	7,655	7,927
Beet Sugar 2/	1000 S. Tons	3,234	3,318	2,692	2,837	2,915	2,988	3,653	3,822	3,396	3,466	3,854	3,845	4,392	4,090	4,493
Cane Sugar 3/	1000 S. Tons	2,985	2,803	3,312	3,072	3,024	3,136	3,328	3,425	3,408	3,225	3,124	3,461	3,446	3,565	3,434
Total Imports	1000 S. Tons	4,881	3,534	3,039	3,472	2,837	2,395	1,767	1,272	2,025	2,568	2,825	2,194	2,039	1,772	1,853
For consumption 4/	1000 S. Tons	NA	NA	2,988	3,009	2,193	1,839	1,221	874	1,376	1,950	2,330	1,525	1,375	1,169	1,614
Other imports 5/	1000 S. Tons	NA	NA	190	439	419	514	577	438	563	547	495	677	664	656	239
Total supply	1000 S. Tons	12,841	11,300	10,716	10,800	10,400	10,291	10,418	10,027	10,155	10,503	11,027	11,024	11,354	11,131	11,117
Use:																
Domestic disappearance	1000 S. Tons	9,946	9,343	9,012	8,717	8,237	7,935	8,192	8,337	8,391	8,658	8,901	9,006	9,197	9,333	9,337
Exports	1000 S. Tons	1,235	238	188	321	403	455	542	383	460	561	627	554	405	454	502
Miscellaneous 6/	1000 S. Tons	14	46	97	138	-12	231	176	-19	60	60	-25	-13	48	7	37
Total use	1000 S. Tons	11,195	9,627	9,297	9,176	8,628	8,621	8,910	8,701	8,911	9,279	9,503	9,547	9,650	9,794	9,876
Ending stocks	1000 S. Tons	1,645	1,673	1,419	1,624	1,772	1,670	1,508	1,326	1,244	1,224	1,524	1,477	1,704	1,337	1,241
Stocks/use ratio	Percent	14.70	17.38	15.26	17.70	20.54	19.37	16.93	15.24	13.96	13.19	16.04	15.47	17.66	13.65	12.57
Raw sugar prices:																
World (No. 11)	Cents/lb.	22.85	9.95	10.13	6.30	3.76	6.29	6.30	9.32	11.91	13.67	9.26	9.22	9.58	11.25	13.86
N. Y. (No. 14) 7/	Cents/lb.	24.92	18.84	21.78	21.84	20.89	20.46	21.68	22.10	22.49	23.29	21.89	21.39	21.49	22.05	22.76
Raw sugar loan rate	Cents/lb.	NA	16.75	17.00	17.50	17.75	18	18	18	18	18	18	18	18	18	18
Beet sugar loan rate	Cents/lb.	NA	19.70	20.15	20.86	20.76	21.06	21.09	21.16	21.37	21.54	21.93	22.85	23.33	23.62	23.43
Grower prices: 8/																
Sugarbeets	Doll/ton	47.20	29.20	35.40	37.00	34.70	33.80	35.90	38.20	41.20	42.10	43.00	38.50	41.40	39.00	38.80
Sugarcane	Doll/ton	38.50	24.90	26.50	27.80	28.20	26.70	27.30	29.10	29.40	29.20	30.80	29.00	28.10	28.50	29.20

U.S. Sugar: Supply, disappearance, and prices, fiscal years 1/

Item	Units	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Sugarbeets-Planted	1000 Acres	1,445	1,368	1,455	1,515	1,545	1,555	1,565	1,575	1,585	1,595	1,605	1,615
Harvested	1000 Acres	1,420	1,323	1,430	1,490	1,520	1,530	1,540	1,550	1,560	1,570	1,580	1,590
Yield	Tons/Acre	19.8	20.2	21.0	20.3	20.3	20.3	20.3	20.3	20.3	20.3	20.3	20.3
Production	Mil. S. Tons	28.1	26.7	30.0	30.3	30.9	31.1	31.3	31.5	31.7	31.9	32.1	32.3
Sugarcane-Harvested	1000 Acres	901	847	877	916	918	917	917	927	927	926	926	926
Yield	Tons/Acre	32.8	33.1	32.3	31.4	31.3	31.3	31.2	31.2	31.2	31.3	31.3	31.3
Production	Mil. S. Tons	29.6	28.1	28.3	28.7	28.7	28.7	28.6	28.9	28.9	29.0	29.0	29.0
Supply:													
Beginning Stocks	1000 S. Tons	1,241	1,492	1,485	1,447	1,500	1,520	1,540	1,550	1,570	1,590	1,610	1,630
Production	1000 S. Tons	7,370	7,203	7,735	7,885	8,015	8,075	8,125	8,225	8,285	8,355	8,425	8,485
Beet Sugar 2/	1000 S. Tons	3,916	4,013	4,400	4,520	4,630	4,670	4,710	4,760	4,800	4,850	4,900	4,940
Cane Sugar 3/	1000 S. Tons	3,454	3,190	3,335	3,365	3,385	3,405	3,415	3,465	3,485	3,505	3,525	3,545
Total imports	1000 S. Tons	2,772	2,765	2,327	2,518	2,475	2,535	2,595	2,625	2,695	2,755	2,815	2,885
For consumption 4/	1000 S. Tons	2,232	2,272	2,017	2,068	2,025	2,085	2,145	2,175	2,245	2,305	2,365	2,435
Other imports 5/	1000 S. Tons	540	493	310	450	450	450	450	450	450	450	450	450
Total supply	1000 S. Tons	11,383	11,460	11,547	11,850	11,990	12,130	12,260	12,400	12,550	12,700	12,850	13,000
Use:													
Domestic disappearance	1000 S. Tons	9,554	9,766	9,900	10,020	10,140	10,260	10,380	10,500	10,630	10,760	10,890	11,020
Exports	1000 S. Tons	385	211	200	330	330	330	330	330	330	330	330	330
Miscellaneous 6/	1000 S. Tons	-48	-1	0	0	0	0	0	0	0	0	0	0
Total use	1000 S. Tons	9,891	9,977	10,100	10,350	10,470	10,590	10,710	10,830	10,960	11,090	11,220	11,350
Ending stocks	1000 S. Tons	1,492	1,485	1,447	1,500	1,520	1,540	1,550	1,570	1,590	1,610	1,630	1,650
Stocks/use ratio	Percent	15.1	14.9	14.3	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5	14.5
Raw sugar prices:													
World (No. 11)	Cents/lb.	12.40	11.67	11.10	11.70	11.80	12.10	12.50	12.80	13.20	13.50	13.80	13.50
N. Y. (No. 14) 7/	Cents/lb.	22.50	22.00	22.06	22.00	22.00	22.00	22.00	22.00	22.00	22.00	22.00	22.00
Raw sugar loan rate	Cents/lb.	18.00	18.00	18.00	18.00	18.00	18.00	18.00	18.00	18.00	18.00	18.00	18.00
Beet sugar loan rate	Cents/lb.	22.90	22.90	22.90	22.90	22.90	22.90	22.90	22.90	22.90	22.90	22.90	22.90
Grower prices: 8/													
Sugarbeets	Dol./ton	38.10	41.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00	40.00
Sugarcane	Dol./ton	29.40	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00

NA = Not applicable.

1/ Fiscal year is October 1 through September 30. The 1996 crop corresponds with fiscal 1997, etc. Historic data for area planted, harvested, yield, production, and prices of sugarbeets and sugarcane are on the NASS crop year basis; all other data are on a fiscal year basis. 2/ Beet sugar yield, raw value, per ton of beets (not including sugar from molasses) rises on trend, at 0.04 percentage points each year. Desugaring of molasses adds a net 275,000 tons in 1998, 300,000 tons in 1999, and then rises slowly to 330,000 tons by 2007. 3/ Raw cane sugar yield per ton of cane rises 0.4 percent per year as new processing technology is adopted. 4/ Quota imports, both raw and refined, at the low rate of duty and very small amounts of high-duty imports. Projected imports do not necessarily reflect the determination by the Secretary which will be made pursuant to Additional U.S. Note 3 of Chap. 17 of the HTSUS. 5/ For re-export & for polyhydric alcohol. 6/ Includes CCC disposals, refining loss, and a statistical adjustment to account for invisible stock change.

7/ Through 1997, fiscal year average of the nearest futures, No. 14 contract, New York Coffee Sugar & Cocoa Exchange; for 1998 forwards, projected.

8/ For 1998 forwards, projected. 9/ HFCS is for calendar year, dry basis (equivalent to refined sugar basis). 10/ Multiplied by 1.07 (to compare with sugar, raw value).

THE FUTURE OF THE U.S. SUGAR INDUSTRY

David Berg
VP - Business Development
American Crystal Sugar Company

I. Introduction

Sugar industry is a mature industry producing a mature product.

There is little reason to expect major changes generated from inside the industry (compared to software, biotech, other industries driven by technological innovation).

Outside drivers will induce falling in three primary categories:

- cost efficiency
- industry structure
- policy initiatives

II. Cost efficiency

US Sugar industry has absorbed 20 years of inflation on raw material and operating side with no increase in price.

Some components of the industry have made significant investments in efficiency.
(*Graphic showing increases in production per acre, beet & cane*)

Future trends: possible effects of low inflation or deflation
rationalization of underperforming or redundant assets

III. Industry structure

Significant concentration of market share has already occurred: (*Barry/Lord study showing increase in SOM held by top four producers*).

Question: Are mergers and consolidations occurring to achieve synergy or size?

Consolidation of suppliers has negated market positioning: Companies forced into role of "all things to all people".

Wild cards remain which could alter industry structure further:
 Direct mill refining on cane side
 Influence of vertical integration / direct producer marketing

IV. Policy initiatives

The status quo: an efficient industry, with balanced sourcing, adequately serving intermediate & final customer needs.

Nevertheless, various groups wish to alter sweetener policy in US (and elsewhere).

industrial sweetener users - lower price
 environmentalists - no sugar production in Florida
 trade negotiators - elimination of trade barriers
 Pope - open Cuba

V. Conclusions / Implications

We are a mature industry producing a mature product.

Changes will most likely come as a result of outside drivers, not due to internal factors.

<u>Outside driver</u>	<u>Industry response</u>	<u>Possible result</u>
capital markets ———	cost efficiency ———	profitability / survival / ???
macro trend toward business consolidation ———	sugar industry structure	shrink to irreducible minimum
outside influence on sweetener policy ———	policy revisions ———	integration of US into world markets

Change will be evolutionary, being driven by outside factors.

Nevertheless, change will continue:

Companies resisting change (efficiency, structure, policy) will be victims.
 Companies responding positively to change will be survivors & winners.

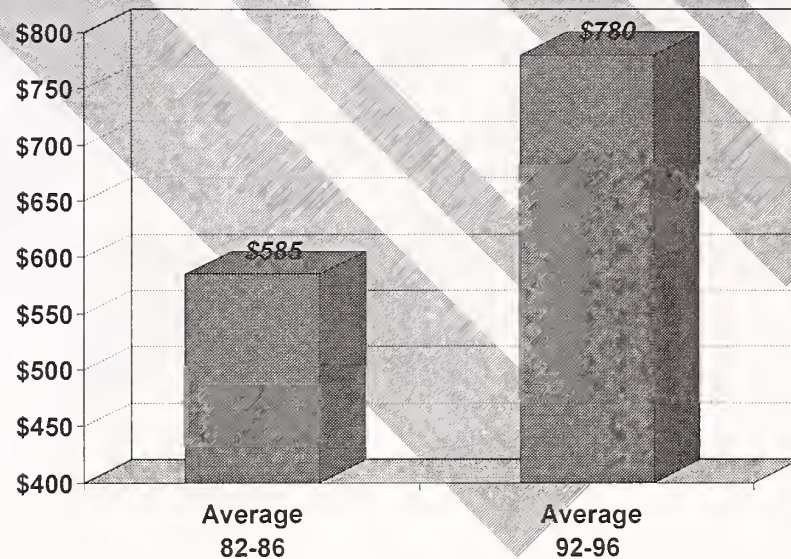
The future of the sugar industry...

- A mature industry, making a mature product
- Three major areas of change:
 - cost efficiency
 - industry structure
 - policy initiatives

Cost efficiency

- Industry has absorbed 20 years of inflation with no increase in price

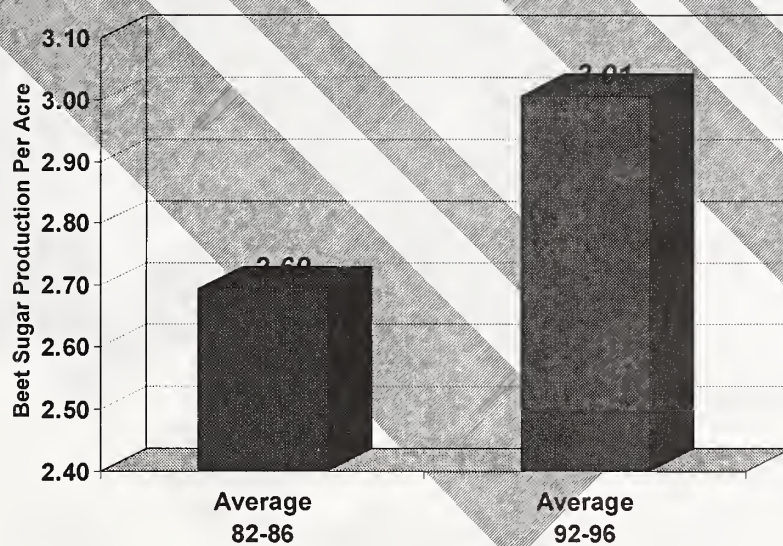
Inflation in sugarbeet production costs: 33% over past 10 years



Cost efficiency

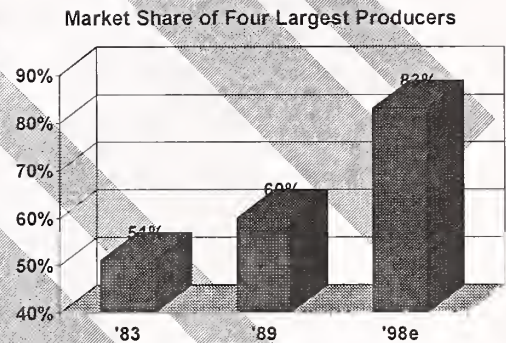
- Industry has absorbed 20 years of inflation with no increase in price
- Most segments have made major investments in productivity

Increased productivity:
12% over 10 years



Industry structure

- Market share concentration
- Synergy vs. size
- Market positioning



Policy initiatives

■ Status quo:

- industry is efficient
- sourcing is balanced
- serving intermediate & final customer needs

Policy initiatives

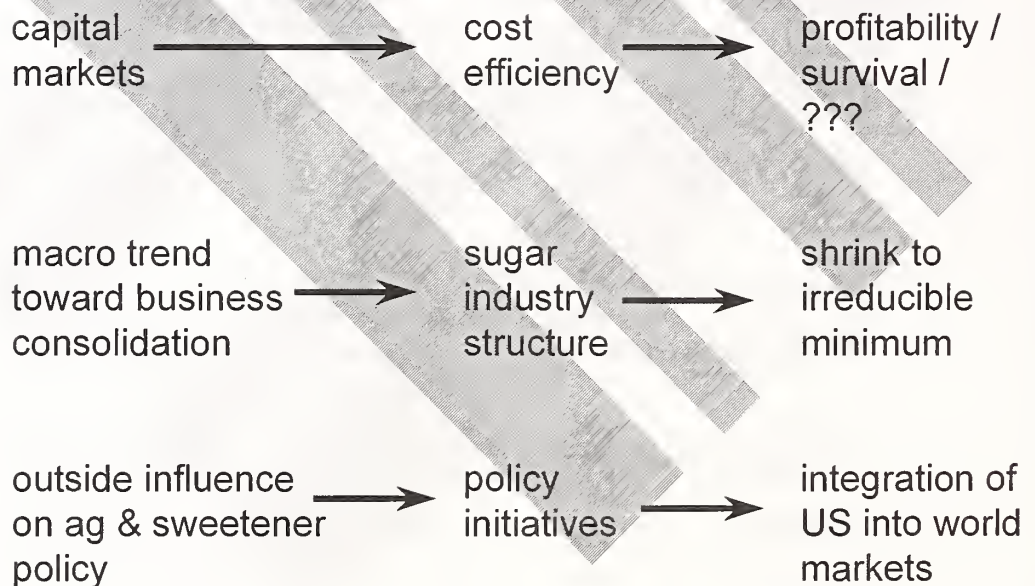
■ Nevertheless--some groups continue to push for change:

- | | |
|---------------------|-----------------------------------------------|
| ☞ industrial users | <i>lower price</i> |
| ☞ environmentalists | <i>end of sugar production
in Florida</i> |
| ☞ trade negotiators | <i>end of ag trade barriers</i> |
| ☞ Pope | <i>open Cuba</i> |

Conclusions / implications

- Repeat: a mature industry producing a mature product
- Changes will come in response to external drivers

Outside factors will induce change



When considering the future...

“We must become the
change we want to see”

Gandhi

or on the other hand...

“If we don’t change
direction soon, we’ll end
up where we’re going.”

Professor Irwin Corey

SUGARCANE INDUSTRY'S GOAL FOR SURVIVAL IN LOUISIANA

Jackie Theriot
General Manager, Louisiana Sugarcane Cooperative, Inc.

Although there may have been sugarcane earlier, records indicate that in 1750, Jesuit priests in New Orleans obtained sugarcane stalks from Santo Domingo and planted them in present day Jackson Square. These stalks later became widely known as the "Creole" variety. This variety was planted and harvested with attempts to produce syrup and extend it to a granulated product. Although sugar was not granulated there was a rum-like liquid made from the juice.

After several years, sugar was finally granulated by Etienne deBore in 1795, more than 200 years ago. This new process launched Louisiana into the sugarcane industry that is still viable, vibrant, and growing as we meet. The path has not been an easy one. From 100,000 pounds of granulated sugar produced in 1795, today Louisiana produces 2,543,000,000 pounds of raw sugar or 1,272,000 tons raw value. In 1795 sugar sold for five cents and in 1801 it was up to eight cents on the open market. Today, on the so called world market sugar sells for 11 to 12 cents per pound.

By 1827 there were 690 sugar houses producing 34,000,000 pounds of sugar. By the beginning of the Civil War there were 1291 factories in Louisiana producing 528,000,000 pounds of sugar. Then came the war and the industry was devastated for the next several years. By the end of 1865, only 175 factories remained and produced 12,000,000 pounds of sugar.

Total investments in the sugar industry before the Civil War were more than \$200,000,000, and by 1865 that investment had dropped off to \$70,000,000. In terms of dollars, more property had been destroyed in Louisiana than in any other state.

Meanwhile, per capita consumption of sugar in the U.S. had been increasing with the advent of the new processed foods industry. Cuba and Hawaii supplied most of this increase. Ninety per cent of sugar requirements were being supplied from overseas.

Although there were some technological advances between 1865 and 1875, little had changed the traditional way of producing sugar. Production costs were up and efficiencies were down. This forced the idea of the central sugar factory. Opponents pointed out that investment in such a large operation was risky for the central factory owner. Proponents believed that this approach would increase profits for growers and millers. By the mid 1890s the central factory concept of milling cane had become generally accepted in the Louisiana sugarcane belt.

By 1900, the Louisiana industry was up to 347 factories that were more modern, large, and efficient mills. These factories produced 604,000,000 pounds of sugar. By 1910, the number of factories had dwindled to 214 and was producing 650,000,000 pounds of sugar or 325,000 tons of sugar.

From that peak, the industry went through a major downsizing to 47,000 tons in 1925 due to the mosaic disease. Also, outside forces, exerting influences on the local industry were factors for modernization. Louisiana was forced to change its ways or face extinction because of world competition. Government tariffs to a small degree helped Louisiana move into the twentieth century.

As production moved upwards once more, the Great Depression came into play causing many financial failures. At this point in history, farmer-owned cooperatives began to appear. Then came World War II. Labor was lost to the war effort. Sugar was the first commodity rationed for fear of the enemy using it for fuel. German prisoners were brought in to harvest the crop in 1943 and 1944. The war gave Louisiana an incentive to produce machinery and equipment to produce the crop more efficiently due to shortage of labor.

By 1950 only 54 mills existed in Louisiana and by 1974 that number had dwindled down to only 37. But those 37 mills produced 594,000 tons of sugar; a significant increase over the 456,000 tons of 1950.

A tremendous change in technology took place over the next 20 years in the Louisiana industry. Mechanization was maximized for more efficiency. Transportation from field to factory was also advanced with more powerful vehicles to move larger tonnage per load. During the 1960s Louisiana continued to increase capacity while at the same time continuing to achieve economical operations. Many of the less efficient factories closed and those in operation continued to grow in size and efficiency. Herbicides replaced hand hoeing and by the 1970s computers were introduced into mill operations. And, the core sampler replaced the subjective hand sampling for verification of cane quality.

By 1974, with the expiration of the Sugar Act, prices went through the ceiling and quickly settled below floor level during the latter part of that decade. This wide fluctuation of price from a high of 69 cents in 1974 to a low of 15-16 cents in the next couple of years took its toll on the farmers. Many opted out of sugarcane production.

In 1994, 20 mills remained in operation in Louisiana and during 1998, 18 mills will be processing sugarcane produced by 690 growers. In 1963 there were 45 mills in operation with 1880 growers. The acreage has increased from 295,000 to 400,000 in that same period of time. Tons produced per grower went from 4000 tons in 1963 to more than 17,000 tons in 1998 while average acreage per farm went from 150 in 1963 to 600 in 1998.

In 1997, Louisiana harvested 12,019,497 tons of sugarcane on 379,247 acres. This amounted to 31.7 tons per acre and produced 6706 lbs. of sugar per acre. There were 1,271,537RV tons of sugar produced during the 1997 crop.

Where do we go from this point? I am reminded that old agriculture is family oriented and is small business while new agriculture is large-scale operations with little emphasis on family farm philosophy. Louisiana is not different. Volume and efficiency are the main objectives for a grower to remain in farming today. We must forget how things were done in the past. Nonetheless, a USDA commission has recently released its findings in attempts to save small family farms.

Today, the Louisiana industry is expanding out toward the Texas border and Arkansas. East Texas is getting itchy at this time. The freeze line toward Arkansas is the only element stopping the forward movement. Acreage is moving out of livestock, rice, soybeans, corn, and cotton. The shift is toward sugarcane production. Sugarcane is a very hardy plant that can handle the constant hammering of hurricanes and heavy rainfall and moisture along the Louisiana coastline. It is a survivor to a degree even though freeze and other adverse weather conditions affect the crop. It is never a total loss.

The philosophy for growing sugarcane in the new area bordering Texas is to work in cooperative groups for planting, production, harvesting, and transporting of the crop back toward the central part of the state. There seem to be merits with this concept. However, the data is not fully available and the jury is still out on this area and the method of sugarcane production utilized by the growers.

In the case of Louisiana Sugarcane Cooperative(LaSuCa), cane would have to be transported far distances to increase the capacity of the two processing facilities. Therefore, a decision was made to eliminate one facility and increase volume and efficiency at the remaining factory. Through efficiency, low transportation costs, proper management, and a decent level in price with increased sugar per acre, the move should allow for a few years of stability in the cooperative. La Su Ca in 1998 has a projection of 820,000 tons of sugarcane for processing compared to 660,000 in 1997, an approximate 20% increase. However, this is probably just halfway to a necessary goal.

Louisiana needs to prepare itself for the time when the Freedom to Farm agreement comes to an end. How will this preparation take place? It can only happen with a hefty infusion of capital. How far is the consolidation movement going? It needs to go far enough to keep our growers in the business of growing sugarcane. Will we be ready for 2003? After having agonized five years to get two factories to merge, I doubt that we can move fast enough to get the necessary results. Louisiana farmers are probably no different from farmers from the rest of the nation. They are independent, culturally and geographically sensitive to changes, strongly opinionated, family oriented, historically conservative and leery of politicians. Any erosion of these traits sends up a red flag and many questions. However, I feel these characteristics have kept this country in a good position vis-a-vis an abundant and steady supply of food.

But times are changing. Do we maintain these traits and standards, suffer economically, and go out of business or do we attempt to adjust and continue to provide for our families? This question persisted for five years in the minds of board members of La Su Ca who were cognizant of their fiduciary responsibility to the members of their organization. However, often there was a lapse of responsibility and a return to the personal memories of how, in their opinions, the organization should continue to provide for the welfare of the farmers in a narrow regional setting. In the end,

good, economic sense prevailed and differences were placed on the back burner and necessary decisions made to stay in business.

In my opinion, eventually, Louisiana should end up with three entities processing in the southwestern part of the state with four factories, one in the northeast central area and six units in the south central area. These 11 factories will process 12 to 14 million tons of sugarcane per year with up to 1,500,000 tons of raw sugar. This tonnage, however, does not get us as efficient as Florida in the processing arena. Florida processes approximately 3.0 million tons of sugarcane per facility over a four to five month period. Louisiana is unable to process for more than 3 months due to freezing conditions.

To have an optimum processing tonnage in the future, Louisiana should be in the range of 1.5 million tons of sugarcane per processing facility. We are almost halfway there. Can this goal be reach in the next two to three years? That's an impossibility with the present trend.

With only three months of processing in Louisiana, there isn't a potential for serious trials during the processing period due to time constraints. Lost time among factories in Louisiana average approximately five to 7% during the harvest. These factories run 24 hours per day and seven days per week.

So, will Louisiana continue to be able to compete with the rest of the country in sugarcane production? An immediate and obvious observation is that there is sufficient land for expansion and more than enough moisture for sugarcane production. Florida, Texas, and Hawaii have their problems with the environment, lack of water, and high labor costs. With reduction in rice and cotton acreage there will be pressure by landowners and growers to find another crop that is suitable and economically viable. Sugarcane is the only secure crop due to its robust tropical and subtropical qualities.

Now, will we be able to compete with the beet industry? That depends on weather conditions and infusion of capital. Normally, the sugarcane growing areas are less likely to sway as much as the beet growing area in tonnage. Weather may be our best trump card.

We look forward to areas in bio-genetics to assist the industry in the future. Tissue culture is already the backbone for disease-free seed cane that is used to propagate three good years of sugarcane tonnage. Varieties are being developed that is "Roundup ready". That would assist in reducing the pressure of weed infestations. Another area being considered but not fully understood at this time are cold-tolerant varieties capable of withstanding mild freezing conditions. It may sound far-fetched but in the Progressive Farmer of March 1996 there is an article titled "Ag Biotech's Destiny". The following is mentioned: "Researchers using genes from fish (flounder from the Arctic) as a new source of antifreeze for plants. This could result in strawberries, potatoes, and other crops that can grow in freezing weather". Sugarcane is also being looked at seriously. That could give us that slight competitive edge that is so important for the Louisiana industry. With varieties withstanding the cold further developments could occur in ethanol production and co-generation.

There is a deadline for the Louisiana industry to be aware of in 2002. At that point we must be in a position to deal with what we believe will be the onslaught of foreign-subsidized sugar that will lack phyto-sanitary restrictions. We contend in Louisiana that we will not be able to depend on our trade negotiators to look out for our best interest. The family farm may fade out of the picture forever. Let me assure you, however, that erasure of government subsidies worldwide would place our growers in a good posture. The problem is we don't believe this utopia can exist by the year 2002.

(Just recently having visited Guatemala gave me the notion that this sugar-producing country will not be able to comply-or may not want to- with the same regulations and rules that our growers have to live by in the U.S. They are moving ahead with increased tonnage. There seems to be absolutely no concern about the environmental state at present. Pollution is rampant around the processing plants.) There will have to be serious negotiations by our trade representatives to bring everyone in line for a true competitive level-playing-field situation. Again, that will be next to impossible.

The future of the Louisiana sugar industry could well be held in balance by our actions to develop other economical benefits for sugarcane and sugar. Molasses, a by-product of sugarcane, normally a cattle feed in the U.S. is also being used to neutralize chromium and make it harmless to the environment. Just last week at the Louisiana Association of Sugar Technologists there was a hard plastic material demonstrated that was made with sugar. Pharmaceutical products may be in the formula down the road.

When we look at cost of production to the grower based on actual and projected data from LSU, we see that a grower who farms 800 acres averages less than two cents per pound on his net returns to management and risk. This acreage produces about 5667 lbs. of sugar per acre. On 800 acres of sugarcane(with 239 acres of fallow land), tenant farmer operator, and at 21 cents/lb. the gross value is \$832.00 per acre. Thirty nine per cent is required for the processing of the grower's crop with a remainder \$523.00 per acre. One sixth is paid to the land owner for rental of the land as the majority of cane grown in Louisiana is rented land. That reduces the cane grower's income to \$411.00 gross per acre prior to fixed and overhead costs. He must account for his fertilizer, herbicide, labor, and other variable costs. According to LSU this cost amounts to \$345.00 per acre with the grower receiving \$66.00 per acre or 1.7 cents per pound. More details are available in the booklet "Projected Costs and Returns--Sugarcane, Louisiana, 1998" by Michael E. Salassi and G. Grant Giesler.

Do we look at returning to the refining of raw sugar as an end product in Louisiana to assist our growers? Some Louisiana factories used to produce plantation white. However, fierce competition in the past 40 years caused sugar factories to produce only raw sugar and refining was done by others. Lack of marketing skills may have had an impact on letting others refine raw sugar. Now we may have to re-think this event. Louisiana may very well have to position itself as Florida is doing today so that we can squeeze every penny to give the growers a necessary income to survive. It will be necessary for the factory side of sugarcane to produce added income for growers. There is still some efficiency to be had on the field production side; however, greater efficiency through increased volume and increased extraction in the factory may give the growers the necessary edge to stay in business.

Two recent developments in the sugarcane industry has assisted in increasing production. The variety LCP85-384 is a very prolific variety that is capable of producing upwards of 40 to 50 tons per acre with sugar reaching approximately 10,000 lbs. per acre. This variety has increased from 15% in 1996 to 29% in 1997. Projections are 40% for 1998. The other development is that of chopper-harvesters. This harvester tends to sweep up all the lodged cane, chop the stalks up into 10 to 12 inch billets, and increases tonnage per acre. It is also increasing sugar per acre. There is a problem, however, with the processing of sugarcane harvested with this system. During dry periods, green cane trash content is satisfactory despite the fact that it produces greater trash over the sugarcane. It is loaded and sent to the factory where washing of the soil is necessary to remove the soil. If too much water is poured over the short billets, sugar is removed from the exposed cuts. Losses can be as much as 12 to 15 lbs per ton. Whole stalk losses are in the vicinity of two to 5 lbs. per ton. There is a concerted effort to change the formula of the core sampler to better reflect the higher trash and fiber content. During wet conditions, there is an abundance of dirt and mud that accompanies the billets to the factory causing poor extraction in the processing.

Today, competition is fierce for the acquisition of sugarcane in Louisiana. But, in the future, as processors mature into an optimum or maximum capacity situation, farmers who continue to expand may not find sufficient processing to handle their crop. Expansion can become a problem for some factories in the future. Fronted on sides either by subdivisions or towns that have encircled the factory, there will be little room for plant expansion and plenty of residential complaints. Due to these reasons, consolidation will become inevitable and factories that are in a rural setting will likely increase in volume.

Until American agriculture has a fair break and is able to compete with other farmers of the world and not with other governments, we will have a difficult task at hand. Developing countries that say they cannot afford the environmental, labor, and safety regulations will be given leeway by our negotiators to "adjust and overhaul over time" and that will afford them the continued advantages they have today. This cannot be tolerated if we are to survive and continue to produce and receive a necessary income to keep us in the business of farming, regardless of the commodity. But even more so with the commodities that have to compete with those exported to the U.S. Let us hope that one day we do not wake up to find that the majority of food consumed in this country is imported because our trade position was in favor of other farmers around the world due to a "break" given to them. Although other farm commodities may revert to permanent legislation after the 1996 farm bill, sugar farmers can take no such comfort, since sugar policy was not included in the original farm bill written in the 1949 act. Although our costs of production are well below world average, the field is even more steeply sloped against the American farmer. Despite the Uruguay Round reforms, EU price supports are still 40% above U.S. levels. That will not change until the year 2000. The European Union relies on an elaborate export subsidy program that effectively drives down the world price to 10 or 11 cents, approximately half the average cost of production worldwide.

We must continue to look toward the year 2003. Louisiana will hopefully be ready to compete with all the variables that will exist at that time. More research, more efficiency, greater volume, and some assistance from our trade negotiators should give us the hope to survive in this great industry.

To quote Mr. Ramon Billeaud who was active in the Louisiana industry until his death this past year, "What a remarkable industry! Born in the 1790s basking in the success of the "Golden Age", brought to its knees by the Civil War, recovering and rebuilding only to be ravaged by mosaic disease and the Great Depression, rebuilding through research and technology, only to be shocked by the loss of the Sugar Act and the onslaught of corn sweeteners, reestablishing good legislation with growth potential through the Farm Bill(s), and now facing yet another challenge in the form of liberalizing of international trade. I am supremely confident that this great industry will rise to the occasion, as it has so many times in the past, and that this new challenge will be met and mastered. I only wish that I could be here 200 years from now to hear someone tell the story. It will be interesting!!!"

References:

"Early Louisiana and the Birth of an Industry"

By: Glenn R. Conrad

"The Industry That Would Not Die"

By: Ramon Billeaud

Louisiana State University

Charts and Tables by Mike Salassi

And Grant Giesler

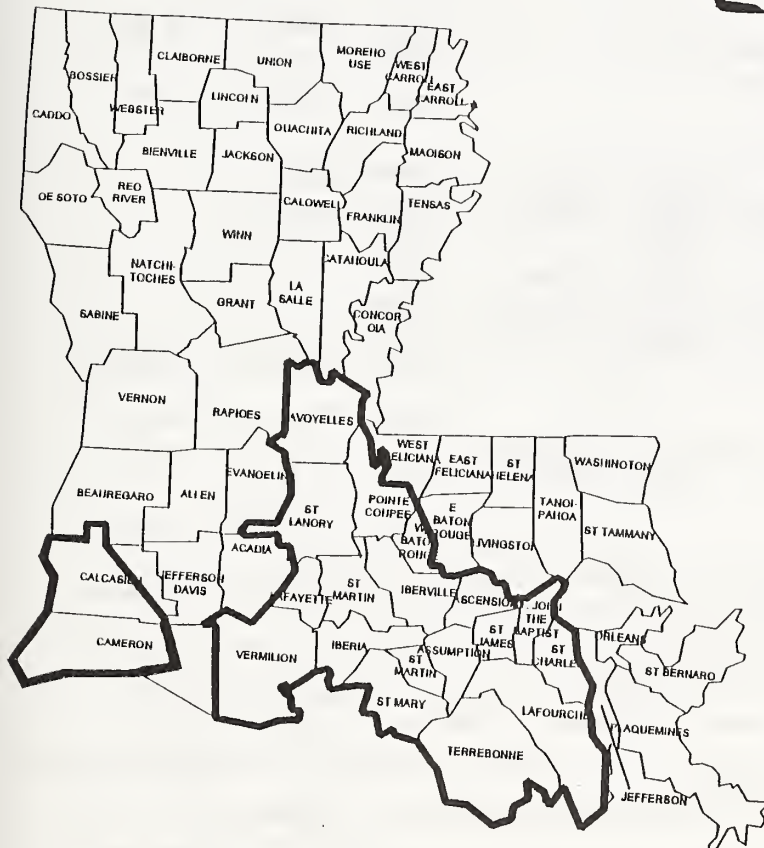


Table 1. Projected Costs and Returns on 800 Acres of Sugarcane, Tenant-Operator, Louisiana, 1998

Item	Dollars Per Acre	Number of Acres	Total Dollar Value	Per Acre Dollar Value 5/	Per Pound of Sugar Value 6/
	(\$/acre)	(acres)	(\$)	(\$/acre)	(\$/lb)
GROSS VALUE OF PRODUCTION: 1/					
Sugar: Plantcane (6,000 lbs/acre)	1,260.00	161.3	203,213		
1st stubble (5,800 lbs/acre)	1,218.00	200.0	243,600		
2nd stubble (5,200 lbs/acre)	1,092.00	200.0	218,400		
Total sugar			665,213	831.52	0.210
Molasses	--	--	31,233		
TOTAL GROSS VALUE			696,446	870.56	0.220
MILL CHARGE (Payment in kind):					
Sugar (39%)	--	--	259,433		
Molasses	--	--	18,373		
Total mill charge			277,806	347.26	0.088
NET RETURNS TO LAND AND PRODUCER			481,641	523.30	0.132
LAND RENT (Payment in kind):					
Sugar (20% after mill charge)	--	--	81,156		
Molasses(20% after mill charge)	--	--	2,572		
Total land charge			83,728	104.66	0.026
PRODUCER INCOME					
Sugar and Molasses	--	--	334,912	418.64	0.106
Marketing Assessment (\$0.2475/cut)	--	--	(3,826)		
ASCL Check Off (\$0.10 /ton)	--	--	(1,584)		
Total income			329,503	411.88	0.104
PRODUCTION EXPENSES: 3/					
Fallow Field Operations	67.84	200.0	13,568		
Seedbed Preparation	75.92	200.0	15,184		
Planting Cultured Seedcane	678.48	6.5	4,397		
Planting Propagated Seedcane	153.43	193.6	29,704		
Plant Cane Field Operations	196.16	200.0	39,232		
1st Stubble Field Operations	175.39	200.0	35,078		
2nd Stubble Field Operations	194.58	200.0	38,916		
Harvest for Sugar 4/	100.68	561.3	56,507		
Total specified expenses			232,585	290.73	0.073
RETURNS ABOVE TOTAL SPECIFIED EXPENSES			96,917	121.15	0.031
OVERHEAD EXPENSES	54.66	800.0	43,728	54.66	0.014
NET RETURNS TO MANAGEMENT AND RISK			53,189	66.49	0.017

- 1/ Gross value of production is determined using estimated production from 800 acres of sugarcane land in a standard rotation (fallow/plant, plantcane, 1st stubble, and 2nd stubble). Raw sugar is valued at 21.0 cents per pound and molasses at 34.0 cents per gallon.
- 2/ Harvested sugarcane is assumed to be transloaded to custom truck and trailer. Hauling costs from farm to mill and hauling rebate are excluded.
- 3/ Each category of production expense listed includes all cost associated with the specified operations including cost of inputs, labor, fuel, repairs, fixed expenses, and interest on operating capital.
- 4/ Harvest costs are estimated assuming 50% of sugarcane is harvested using a two-row wholestalk harvester and 50% is harvested with a combine harvester.
- 5/ Per acre dollar value is calculated by dividing total dollar value by total farm acreage (800 acres).
- 6/ Per pound of sugar value is calculated by dividing total dollar value by total sugar production over 800 farm acres (3,167,681 pounds).

**Estimated Average Cost Per Pound of Raw Sugar
for Alternative Mill Sizes, 1990-1994**

Mill Capacity (tons of cane/day)	Season Length (days)	Total Tons of Cane Ground (tons)	Total Raw Sugar Produced (1000 lbs)	Estimated Average Cost per Pound of Sugar	
				Predicted Value (\$/lb)	Confidence Interval (95%) (\$/lb)
3,000	85	255,000	51,000	0.243	0.223 - 0.263
4,000	85	340,000	68,000	0.223	0.203 - 0.242
5,000	85	425,000	85,000	0.210	0.190 - 0.230
6,000	85	510,000	102,000	0.199	0.179 - 0.219
7,000	85	595,000	119,000	0.196	0.176 - 0.216
8,000	85	680,000	136,000	0.192	0.172 - 0.212
9,000	85	765,000	153,000	0.188	0.168 - 0.208
10,000	85	850,000	170,000	0.186	0.165 - 0.206
15,000	85	1,275,000	255,000	0.177	0.157 - 0.198
20,000	85	1,700,000	340,000	0.173	0.153 - 0.194

**Louisiana Raw Sugar Factory
Numbers and Capacity, 1960-1990**

	1960	1970	1980	1990
Number of factories	46	43	24	21
Tons of cane per 24 hours	Number of factories by capacity			
< 1,000	1	1	1	1
1,000 - 1,999	15	4	--	--
2,000 - 2,999	20	13	1	1
3,000 - 3,999	5	10	5	1
4,000 - 4,999	3	10	7	1
5,000 - 5,999	2	2	6	2
6,000 - 6,999	--	3	1	9
7,000 - 7,999	--	--	3	1
8,000 - 8,999	--	--	--	2
9,000 - 9,999	--	--	--	1
10,000 - 10,999	--	--	--	1

Louisiana Sugar Factory Production, 1986-1996

Year	<u>Gross Tons Cane Ground</u>		<u>Tons 96° Sugar</u>	
	Total	Avg. / Mill	Total	Avg. / Mill
1986	7,419,897	370,995	657,087	32,854
1987	6,595,625	329,781	721,783	36,089
1988	7,678,229	383,911	786,155	39,380
1989	8,242,060	412,103	833,273	41,664
1990	4,596,123	241,901	429,380	22,599
1991	7,940,269	417,909	741,096	39,005
1992	8,908,374	468,862	858,971	45,209
1993	9,162,023	482,212	870,255	45,803
1994	9,576,810	504,043	994,267	52,330
1995	10,585,417	557,127	1,051,438	55,339
1996	10,488,107	582,673	1,030,287	57,238

Selected Measures of Output and Performance Sample Average Per Raw Sugar Mill, Louisiana, 1990-1994

Item	1990	1991	1992	1993	1994
Number of Mills	13	14	14	14	14
Cane Ground (tons)	207,455	359,039	407,010	420,176	438,423
24 Hr. Vol. (tons)	5,199	5,387	5,579	5,855	5,998
% of Capacity	87.8	91.8	91.1	93.6	90.0
Raw Sugar (tons)	19,583	33,929	38,705	40,104	45,097
• per Ton of Cane	188.79	189.00	190.19	190.89	205.72
Total Costs (\$1,000)	10,000	14,504	16,203	16,970	18,750
• per Ton of Cane (\$)	48.20	40.40	39.81	40.39	42.77
• per Pound of Sugar (\$)	0.255	0.214	0.209	0.212	0.208

THE U.S. SUGAR INDUSTRY FROM THE POINT OF VIEW OF A CANE SUGAR REFINER

Margaret Blamberg, Ph.D.
Vice President, Domino Sugar Corporation
New York

First of all, I would like to express my thanks to the U.S.D.A. and the organizers of this conference, especially John Love of the World Board, for inviting me to address you today and for soliciting the comments of an independent cane sugar refiner on the future of our industry.

When this topic was first proposed, a colleague of mine suggested (not entirely tongue in cheek) that I might recast the question as, "Does the U.S. cane sugar refining industry, and with it the sugar industry as we know it, have a future?" Let me explain.

Since its inception, the U.S. sugar program has been prejudicial against the interests of cane refiners -- witness the decline in the number of cane refineries by half since 1981, when the current program began. Additionally, those remaining refineries often operate at far less than full capacity.

I would like to make one thing clear. Absent a sugar support program and with free access to the world market, cane refiners believe we could compete with any sugar producer in the world. And if we could not, it would be our own fault and we would have to bear the consequences.

We do not operate, however, in the mythical free market. Instead various sugar regimes, tariff barriers and so-called free trade associations predominate. Additionally, domestic producer/refiners -- the so-called "white-ends" made possible by the benefits accrued to producers by the sugar program -- challenge the traditional refining industry. With that perspective in mind, independent cane sugar refiners require reform of the sugar program in such a way that our needs are recognized and provided for within the context of the program -- until such time as the programs for sugar and other supported crops disappear.

Such an approach is for the good not only of the cane refining industry, but for the industrial users, consumers and the sugar industry as a whole. We all know that cane refiners provide elasticity in the system, running at full capacity to fulfill domestic needs whenever nature delivers a poor beet sugar outturn. Even more to the point, a further decline in refining capacity will jeopardize the nation's sugar supply more than in the past since beet expansion is taking place in regions that are most susceptible to the vagaries of weather. As reliance on cane white-ends grows, the prospect of a poor domestic cane crop further emphasizes the need for sufficient independent capacity capable of refining imported raws. Without sufficient cane refining capacity, industrial users would be forced to rely on imported refined sugar -- with its inherent problems of timeliness and quality for consumers and in direct competition with domestic beet processors and cane producer/refiners.

In 1996, the Senate and House Appropriations Committees requested that the Secretary of Agriculture file a biannual report on the operation of the sugar program. In his most recent report at the beginning of this year, Secretary Glickman stated that the objective of the program is "... to assure an adequate supply of sugar for the citizens of the United States at reasonable prices."

Recognizing that refiners need two things -- an adequate supply of raw materials at a reasonable price, the U.S.D.A. has made strides in achieving the latter of these two objectives. At the urging of the Appropriations Committees the Department promulgated a formula for determining quota increases based on the stock/use ratio of 15.5% in an effort to depoliticize the quota calculation. Thus far, the system has worked well, with #14 prices moving in a relatively stable and modest band as the quota self-adjusts over time.

The U.S.D.A. is to be commended for this policy. At the same time, it should be recognized that there still remains much room for "politics" in the WASDE (World Agriculture Supply and Demand Estimate) numbers, which determine the size of the quota, particularly in estimates of domestic production early in the quota year and the always elusive estimate of sugar blend imports. (It would be even better for U.S. Customs to prohibit the importation of "designer" blends altogether, such as the current influx of sugar molasses mixtures.) We urge the Department to continue to hew strictly to its goal of keeping quota calculations as objective as possible, especially when the statistics suggest that we are on the cusp of a quota increase, as occurred last month. "Transparency" must be preserved.

The question of an adequate supply of sugar is even thornier than the current issue of WASDE-inspired quota increases. Most disturbing to refiners is the free fall in which the import quota currently finds itself. The reduction of the quota from 2.3 million short tons, raw value, in 1995/96 to 2.1 million tons last year, to 1.6 million tons or less this year not only causes current hardship for refiners but presages even more declines if crops in the beet sector continue to grow due to expanded acreage and the use of genetically-modified seeds.

The prospect of recourse loans below 1.5 million tons and a WTO-mandated minimum quota of 1.25 million tons provides cold comfort for refiners. Since many beet processors do not use the loan program, the Department may not feel constrained from setting the quota below 1.5 million tons in future years. A calculation indicates that the independent refining industry would sustain a capacity utilization level of no more than about 65% by 2000, given a beet crop of 4.5 million tons, white-end production of 1.0 million tons and an import quota of even as much as 2.0 million tons. Such a scenario would presage still more refinery closings, unless a solution to the supply problem is found. Some alternative must be found to provide the cane refining industry with sufficient raw material to keep us afloat -- for the good of consumers, industrial users and the program itself.

Let me turn now to two subsidiary, but nonetheless important, issues about the import quota: shortfalls and quality.

Each year between 4% and 6% of the import quota fails to enter because countries are unable or unwilling to fulfill their allocations. Most countries on this list have not filled their quotas for many years, if ever. With refiners, of necessity, chasing every pound of raw material

available within the system, it is imperative that the Department develop an automatic mechanism for the annual redistribution of shortfalls, preferably on a global basis. This approach was adopted on a trial basis for one year, with excellent results.

The quality issue is a much neglected, but an equally important problem. The import quota system by its very nature provides an incentive for exporters to ship their poorest quality sugar to the United States, while reserving better cargoes for choosier world market destinations. Incentives need to be built into the program that reward better quality shippers, even going as far as quota reallocations if need be.

Two important issues remain to be considered, namely, the NAFTA and trade with our other hemispheric neighbors such as the MERCOSUR countries and Cuba.

At present, it appears that talks have broken down between the U.S.T.R. and Mexico's Ministry of Commerce over the HFCS/sugar dispute, following Mexico's issuance of its final determination on countervailing duties for HFCS. Leaving aside the demand by U.S. manufacturers of HFCS that Mexico honor the original terms of the NAFTA which call for declining duties on high fructose corn syrup, cane refiners as well as other elements of the U.S. sugar industry have a keen stake in this issue as well.

With Mexico seeking a *quid pro quo* in terms of greater sugar access into the United States in return for freer HFCS entry into Mexico, U.S. refiners view this issue as an ideal opportunity to clarify the original NAFTA sweetener side-letter of November 1993 by seeking agreement from Mexico that all additional sugar imports above the current 25,000 ton per annum level consist only of raw cane sugar. We, therefore, call upon U.S.T.R. to pursue a negotiated settlement to the current dispute for the sake of the U.S. sugar industry as well as HFCS producers.

Even if Mexico and the United States do not agree to increased sugar access between now and 2001, it is imperative that a "raws only" understanding be reached before Mexico's sugar quota increases tenfold, to 250,000 tons, in three years' time. Additionally, it must be made clear to all parties that Mexican *estandar* sugar be permitted to enter the United States "for further refining only" to preserve quality standards for U.S. consumers and industrial users as well as preserving throughput for U.S. refiners.

Under the terms of the NAFTA, free trade in sugar is supposed to commence between the United States and Mexico in 2007, but it is often forgotten that such free trade is to take place within the context of the harmonization of sugar programs between the two countries. Debate should begin soon as to possible to determine whether such harmonization should take place in a free trade or a supported environment.

Regarding Cuba, the embargo will be lifted at some time in the future -- although we do not know when or under what circumstances this will occur. We urge the relevant agencies within the Administration as well as the appropriate Congressional committees to enter into talks with the U.S. sugar industry, especially the cane refiners, to develop a contingency plan for the time when trade with Cuba resumes. Independent cane refiners are obviously the linchpin of any

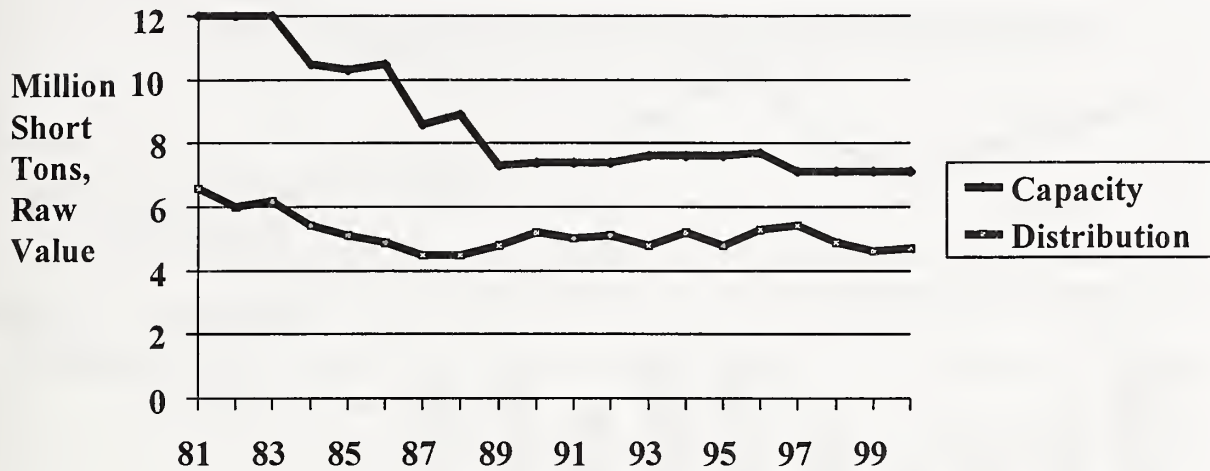
such plan since we will provide the market for Cuban sugar exports, which -- as in the case of Mexico -- must be raws. The same criteria applies to MERCOSUR and other free trade regions.

To sum up: Going into the twenty-first century, a healthy U.S. sugar industry depends on the elasticity provided by independent cane refiners. Yet, cane refiners are an endangered species due to restricted access to raw cane sugar caused by the import quota system. While the U.S.D.A. is to be commended for its stock/use ratio formulation and should be encouraged to make the system a permanent part of the administration of the program, the supply question still needs to be addressed.

Attention to the size of the quota, shortfalls, quality problems, blends from Canada and longer range issues regarding the NAFTA and Cuba all point to a much larger issue -- the need for a fresh look at and a complete revamping of the quota system.

As independent refiners adapt to the challenges posed by the new realities of white-ends, we do not need to do so with one hand tied behind our backs. It is time to take a hard look at the restrictive and outmoded import quota system.

U.S. CANE REFINERS' CAPACITY UTILIZATION

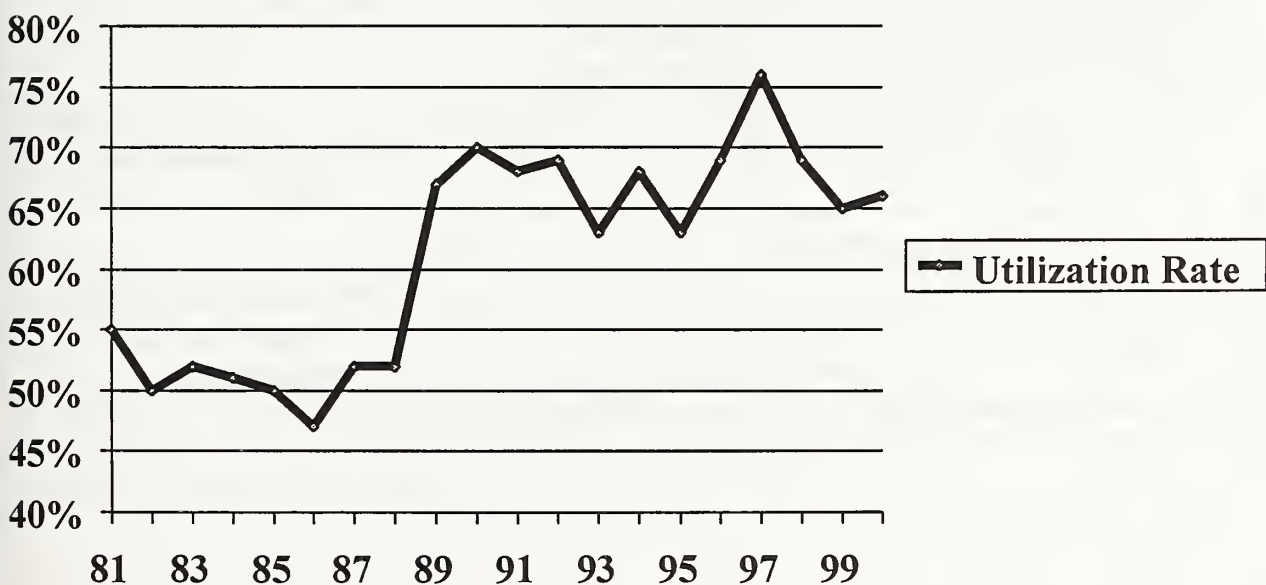


Capacity = 350 Days

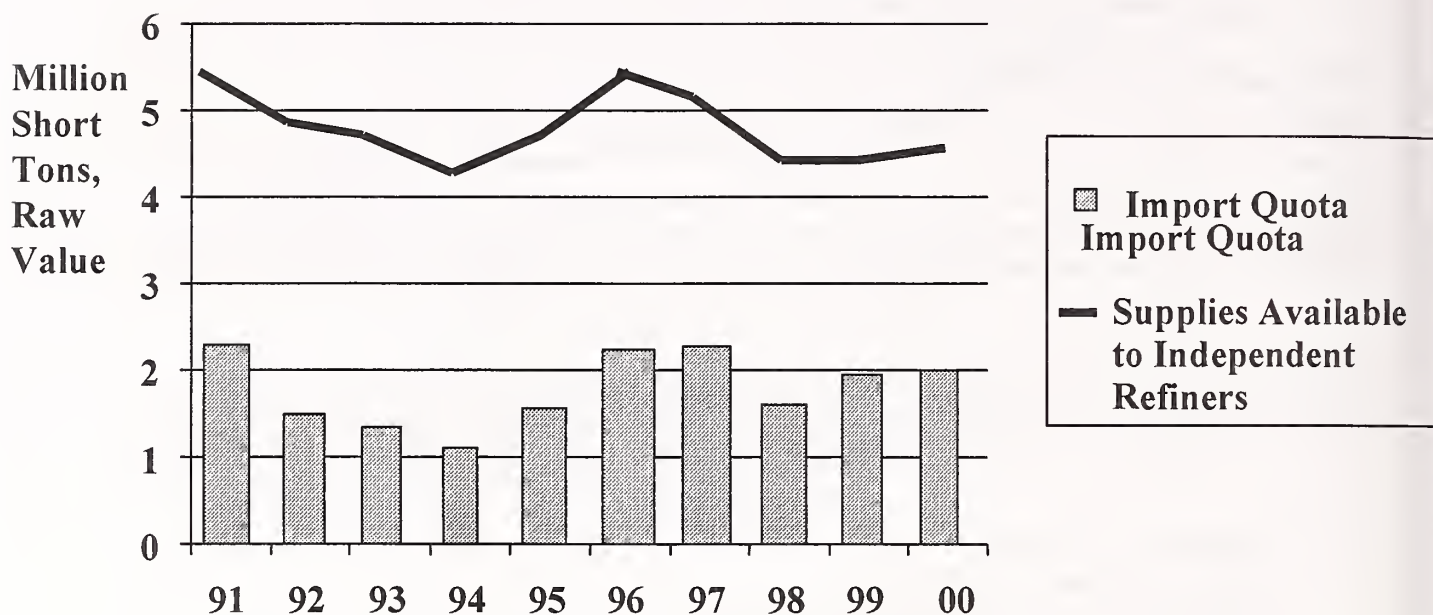
Volume Excludes Re-Exports

Distribution is for Independent Refiners

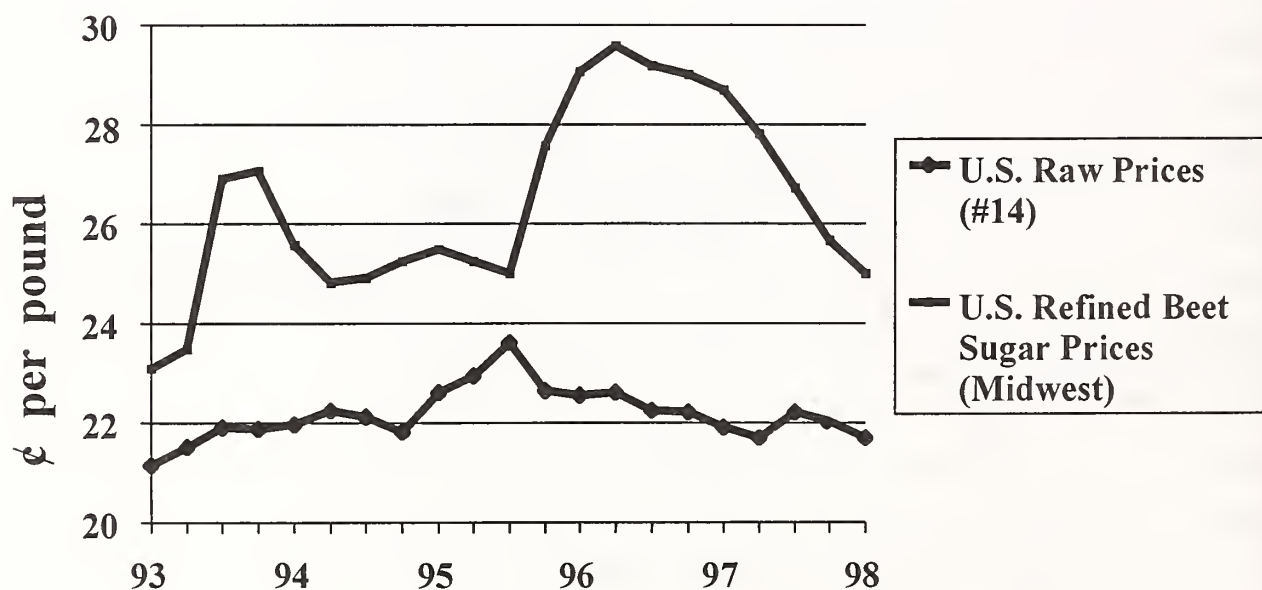
U.S. CANE REFINERS' UTILIZATION RATE



U.S. IMPORT QUOTA: REVIEW AND PROSPECTS



SPREAD BETWEEN REFINED BEET SUGAR PRICES AND #14 MARKET



USDA PERSPECTIVE ON THE OUTLOOK FOR COTTON

Jon Ann Flemings, Stephen MacDonald, Leslie Meyer and Carol Skelly
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World Cotton Situation for 1997/98

The world cotton situation for 1997/98 is characterized by higher production, consumption and ending stocks when compared with the preceding year. Near-record world yields are expected to result in production of 91.0 million bales, an increase of 2 percent from 1996/97. Estimated consumption of 89.3 million bales, while slightly higher than last year, is limited by the economic problems that have developed in Southeast Asia, Korea and Brazil. The excess of production over consumption is anticipated to raise ending stocks over 5 percent, or 2.0 million bales from the beginning level. World prices have responded predictably--the A-index has fallen 12 cents since the beginning of the marketing year.

Foreign Cotton Situation for 1997/98

Foreign Area, Yield and Production

Current estimates reflect an increase in 1997/98 foreign cotton production of 2 percent to 72.0 million bales. The gain is the result of rising yields, which have more than offset a 1-percent decrease in cotton area.

Total foreign area fell an estimated 300,000 hectares, due mainly to decreases in China and Pakistan. China's area reduction was a substantial 5 percent, about 200,000 hectares, as more land was used for food production and farmers continued to switch to more profitable and less labor intensive crops. In Pakistan, prices rose last year and disease problems, as well as improved returns for sugar and rice, reduced area 10 percent, or 300,000 hectares. These area reductions were partially offset by increased plantings in the African Franc Zone, Central Asia, South America and Australia.

Significant increases in production are anticipated in Central Asia and South America. Central Asian production is expected to increase 11 percent or 810,000 bales. Uzbekistan's production alone accounted for an increase of 650,000 bales, 6 percent higher than the previous season, due both to improved weather and crop management techniques. A bumper harvest is expected in Argentina, as higher area and yields are expected to result in a 29-percent increase in production--reaching 2.1 million bales. Brazil's production is benefitting from shifts in area to regions with more mechanized, higher-yielding farms and is expected to rise 45 percent.

These production gains will be partially offset by reduced production in India and Pakistan, attributable to both lower area and weather problems. Area was down an estimated 4 percent on the Indian subcontinent and heavy late-season rains in the Punjab area reduced yields, for a combined reduction of nearly 1.3 million bales in production for the two countries.

Foreign Consumption, Trade and Ending Stocks, 1997/98

Foreign consumption is expected to rise slightly in 1997/98 from a year earlier to just under 78.0 million bales. The economic disruption in Southeast Asia has overshadowed an otherwise promising year--expected growth in cotton consumption outside the United States is now a negligible 0.5 percent. Positive factors in 1997/98 include generally favorable economic growth in developed countries, increased textile production in China, soaring Mexican cotton consumption, and the first upturn in Russia's cotton consumption since the 1980's. However, financial problems in South Korea, Southeast Asia and Brazil have reduced expectations for foreign cotton consumption in a number of ways.

Projected world GDP growth in calendar 1998 has weakened modestly in the last few months, from 2.8 percent expected last October to 2.6 percent in January. On the other hand, the economies of Korea, Indonesia, and Thailand are all expected to contract in calendar 1998--in stark contrast to the 6-10 percent annual expansion of the preceding decade. Together with the Philippines and Malaysia, consumers in these 5 countries consumed about 4 million bales of cotton in the form of textile products in 1996/97, according to the International Cotton Advisory Committee, and will almost certainly consume less in 1997/98. However, even a significant temporary decline in local demand for cotton products in these countries would not necessarily translate directly into reduced mill use of cotton in the region since the cotton products no longer demanded locally could be exported.

Probably the most important factor slowing foreign mill use of cotton in 1997/98 is the cost of capital in the region. With many economic institutions in the region paralyzed, both domestic financing and trade financing has become temporarily unobtainable for some industrial firms in Southeast Asia and Korea. USDA's forecast for 1997/98 cotton consumption by textile mills in Southeast Asia and Korea assumes these liquidity problems will ease through the rest of 1998, an assumption supported by the recent signs of stability throughout much of the region. Mill consumption in Southeast Asia and Korea in 1997/98 is forecast 15 percent below a year earlier, in total, a 900,000-bale reduction.

The region's imports of raw cotton are expected to decline by an even larger amount, and world cotton trade is expected to decline in 1997/98 compared with a year earlier. Imports by Southeast Asia and Korea are expected to decline by more than 1.1 million bales in 1997/98, cutting the region's ending stocks. In Brazil, a decrease of almost 900,000 bales is likely due to a combination of increased production, reduced consumption and government policies constraining imports, while growing cotton supplies and new import policies in China are expected to cut China's imports by 1.4 million bales.

Foreign ending stocks are forecast to rise 1.8 million bales in 1997/98 compared with 1996/97. Although foreign imports are expected to fall, foreign beginning stocks and production are estimated higher in 1997/98, while exports are lower, and consumption is up only negligibly. At 34 million bales, foreign ending stocks in 1997/98 are forecast to reach their highest since 1985/86.

U.S. Cotton Situation for 1997/98

U.S. Area, Yield and Production

U.S. cotton production in 1997/98 is currently estimated at 18.98 million bales, virtually identical to the 1996/97 crop of 18.94 million and the second largest cotton crop on record. Cotton prices had declined early in calendar 1997, making alternative crops more attractive to some cotton producers. As a result, U.S. cotton area declined 5.6 percent from 1996 to 13.8 million acres. Upland area in 1997/98 decreased to nearly 13.6 million acres, while the ELS acreage slipped to 252,000 acres. Despite the reduction in cotton plantings, a lower than normal abandonment of 4 percent in 1997/98 kept harvested area above that of last season. In 1997/98, cotton harvested area approached 13.3 million acres, compared with 12.9 million during 1996/97, offsetting an estimated decline of 21 pounds in the national average yield to 686 pounds per harvested acre.

Upland production is estimated at 18.4 million bales this season, with an average yield of 679 pounds per harvested acre. While the U.S. upland crop size is similar to that of last season, three of the four regions produced less cotton in 1997/98; only the Southwest produced more cotton than in 1996/97. In the Southwest, upland production reached 5.5 million bales this season, 1 million above last year, as a much smaller abandonment provided more harvested acres without sacrificing yield. Southwest yields averaged slightly below 500 pounds per harvested acre in both 1996/97 and 1997/98.

Meanwhile, the production declines in the other three regions resulted from either lower harvested area or lower yield. In the Delta, lower area was partially offset by an improvement in yields. Nearly 5.8 million bales of upland cotton were produced in 1997/98, 300,000 below the year before. However, yields of nearly 900 pounds per harvested acre in Mississippi and Arkansas helped push the Delta's average yield to 813 pounds, compared with 748 pounds a year earlier. In the Southeast, production totaled 4.1 million bales, 500,000 below 1996/97. Although harvested area was similar to the previous season, an 83-pound drop in the region's average yield to 645 pounds accounted for the crop decline. In the West, decreases were smaller with production dropping 150,000 bales from 1996/97. A 40-pound increase in the region's yield to 1,184 pounds could not offset the total effect of the decline in area.

ELS cotton production is estimated slightly higher this season at 537,000 bales. The rise in the ELS crop in 1997/98 was the result of higher yields which were partially offset by lower area. While total ELS acreage decreased in 1997/98, California continued to expand its acreage and accounted for three-fourths of the area and production.

U.S. Domestic Mill Use, 1997/98

The outlook for U.S. cotton demand points higher in 1997/98 as U.S. mill use is supported by increases in domestic cotton consumption at the retail level and textile exports. The strong economy and consumer preference for cotton products are continuing trends supporting retail cotton consumption; domestic consumption (mill use plus net textile trade) rose nearly 10 percent in calendar 1997 after three years of stability, raising per capita cotton consumption to 32 pounds, the highest in 50 years.

Total fiber use by domestic mills has also risen this season, but cotton use has increased faster than that of manmade fibers. During the first part of 1997/98, cotton's share of fiber use on the cotton system has averaged nearly 79 percent, up nearly 1 percentage point from last year and the highest in 30 years. In 1997/98, U.S. cotton mill use is expected to reach 11.5 million bales, 3 percent above 1996/97, as abundant supplies of cotton are available at competitive prices to satisfy demand. Upland mill use in 1997/98 is estimated at about 11.4 million bales, while ELS consumption is projected to reach 110,000 bales. Based on the first 5 months of data from the Department of Commerce, the seasonally adjusted annual rate of cotton consumption has averaged above 11.5 million bales.

Textile imports, textile exports and the net textile trade deficit all rose in calendar 1997. Textile imports increased 20 percent to the equivalent of 10.5 million bales of raw cotton. At the same time, U.S. cotton textile exports increased by a like percentage, reaching the equivalent of 3.75 million bales of raw cotton, aided by the success of textile trade agreements such as CBI and NAFTA. After remaining relatively stable for the three preceding years, the cotton textile deficit jumped to a new record in 1997 of 3.2 billion pounds, or the equivalent of 6.7 million bales of raw cotton.

U.S. Exports, Ending Stocks and Prices, 1997/98

U.S. exports are estimated at 7.3 million bales for 1997/98, which constitutes a strong 27.8 percent share of world trade. Upland cotton exports of 6,875,000 and ELS cotton exports of 425,000 bales are expected. The competitiveness of U.S. cotton, especially in the first half of the season, has been enhanced by a number of factors, including relatively large beginning stocks, weak competition from the Central Asian cotton-producing countries, and the rapid growth of cotton consumption in Mexico, which imports U.S. cotton almost exclusively.

U.S. exports have also been affected by several government program provisions--the Step 2 payment to exporters, the GSM-102 credit program and the reduction in the CCC loan period from 18 to 10 months under the 1996 farm legislation. Step 2 payments averaged about 1.4 cents per pound from August 1 to February 1, but the payment rate rose to 4.5 cents on February 19. Step 2 payments to exporters are made as of the date of shipment and are unknown at the time of sale, making them a less effective tool than in the past for improving price competitiveness. However, in the context of the current rising spread between U.S. and foreign prices, the potential for Step 2 payments provides an incentive for continued sales, and a disincentive for cancellations, of U.S. export contracts. In addition to Step 2, the availability of GSM-102 credit for Korea is sustaining U.S. market share which otherwise would have declined with the Asian currency crisis.

The effect of the loan period change has become more evident recently with falling prices---the price received by farmers has fallen about 7 cents per pound during the harvest period. During the period 1980-1995, when 18-month loans were available, the percent of production placed under loan increased as market prices fell closer to the loan rate. Analysis of this pattern suggests that at current prices with an 18-month loan, loan placements might total one-fourth to one-third of the total upland cotton production, or roughly 4.5-6.0 million bales. As of February 10, only 3.5 million bales have entered the CCC loan, suggesting that total loan placements may not reach the bottom of the historical range; thus, proportionally more cotton is being actively marketed by producers. On the other hand, at the current AWP level of less than 55 cents per pound, the Commodity Credit Corporation has begun to pay a portion of the carrying charges accrued on loans placed early in the season, and this may make the loan a more desirable short-term option.

Larger estimated U.S. mill use and exports are not anticipated to offset larger cotton supplies, with the result that ending stocks are projected to rise marginally, from 4.0 million to 4.2 million bales. This season's stocks-to-use ratio of 22.3 percent will be nearly identical to that of last year. The average price received by farmers has fallen from about 67 cents in August 1997 to 62.6 cents in mid-January 1998. U.S. prices have responded to falling world prices which have, in turn, resulted from an accumulation of foreign stocks and the uncertainties surrounding the Asian cotton situation.

World Cotton Outlook for 1998/99

The preliminary outlook for the world in 1998/99 shows production down, consumption up marginally, and world ending stocks significantly lower. Global production is expected to respond to the current reduced level of world cotton prices and consumption will continue to be limited by lower GDP growth stemming from the Asian financial crisis. World trade is estimated down marginally due mainly to lower projected import demand by China.

Foreign Cotton Outlook for 1998/99

Foreign Area, Yield and Production

The decline in prices during the marketing year to date will probably influence price expectations for the coming year, and a slight decline in foreign area is likely. In total, foreign area could range from 27.5 to 28.5 million hectares as virtually every producing country either reduces or, at best, maintains area compared with 1997/98. In China, increased grain prices this year suggest higher returns for competing crops, while producers in some regions of India may switch crops following weather-reduced yields and quality during 1997/98. Uzbekistan has signaled its intention of maintaining its area at 1.5 million hectares for the fourth consecutive year, and area in Pakistan is likely to remain near 3.0 million hectares, also for the fourth consecutive year.

Foreign yield prospects are also weaker on average compared with 1997/98 in part due to reduced area and yield in China. China's reported yields were record-high in 1997/98, surpassing even 1984/85 by 4 percent. While regional shifts in production and better management of insect problems suggest China's yields could be trending up, weather was also unusually favorable in

some regions. More normal weather patterns are likely to prevail in China in 1998/99, and a sixth consecutive yield increase is unlikely.

Foreign production could drop between 2 to 3 percent compared with a year earlier in 1998/99. Compared with 72 million bales in 1997/98, foreign production is likely to range between 69 and 71 million bales in 1998/99. Lower production is likely in China due to large cotton supplies and rising grain prices, while falling world prices during the first half of 1997/98 suggest that Australia's crop could decline as well.

Foreign Consumption, Trade and Ending Stocks

Foreign consumption is likely to increase for the fourth consecutive year in 1998/99, but much depends of the future impacts of this winter's Asian crisis. Foreign consumption could range between 77.5 million and 79.5 million bales. If Southeast Asia recovers quickly from its current liquidity problems, then the region's lower exchange rates provide a good basis for increased exports of textile products. Some of these exports could come at the expense of competitors with stronger exchange rates, but global consumption of textiles could also be higher as lower production costs in Southeast Asia and Korea help trim textile prices. One problem that will continue through 1998 and beyond is reduced purchasing power by consumers in Southeast Asia, so some textile capacity originally aimed at domestic Southeast Asian consumers will be reoriented towards exporting and some will be dismantled. However, GDP growth is expected to rebound in most of Asia in 1999, and domestic consumption of textiles in the region would also be expected to rise.

Even if the liquidity problems in Asia continue to hamper textile exports from the region during 1998/99, generally good economic growth prospects can be expected to sustain cotton mill use in other regions. Both Japan and the European Union are expected to have faster GDP growth than the year before in 1998, and again in 1999. Russia's mill consumption of cotton would be expected to increase again in 1998/99 and, if Southeast Asian mills continue to lag in 1998/99, then China's consumption could continue rising. Increases are also expected in Brazil and Mexico.

In the longer run, the labor and capital resources freed up by the failure of businesses producing for the Southeast Asian domestic market could be largely utilized by export-oriented enterprises. The increased cost of capital in much of Asia will increase the cost of capital-intensive facilities like synthetic fiber plants, helping reduce the region's expected capacity for fiber production. Even in the short run, some unprofitable plants may be shut down as their owners' ability to bear these losses is reduced. Thus, in the long run, investment will tend to shift to the production of goods appropriate to the region's current resource endowments and capable of earning an adequate return in foreign exchange. This suggests that textile production, and cotton spinning, could increase at a faster rate than that observed during the first half of the 1990's.

Foreign imports would be supported in 1998/99 by increased consumption and stockbuilding associated with rebounding economies in Korea, Southeast Asia, and Brazil, but world trade could shrink slightly if China continues its efforts to replace imported cotton with domestic staple. Foreign exports are likely to rise in 1998/99 as competing exporters work off the stocks

accumulated during 1997/98. In Central Asia and Africa's Franc Zone, 1997/98 crop gains are likely to move disproportionately into stocks during 1997/98 rather than exports, and by 1998/99 the export pace can be expected to improve. Similarly, exports of Australia's record 1997/98 crop have been disrupted by Asia's financial problems, and delayed shipments could mean larger exports in 1998/99.

Foreign ending stocks would be expected to fall in 1998/99 due to lower production and increased consumption.

U.S. Cotton Outlook for 1998/99

U.S. Area, Yield and Production

U.S. 1998 cotton planted acreage is likely to decline for the third consecutive year. USDA's survey of producers' planting intentions will be published March 31; our current subjective estimate is that area will be down nearly 1.0 million acres to 12.9 million. Reductions in planted acreage are attributable to the current price levels of cotton and alternative crops, but also to continued structural adjustments by producers to the new policy environment.

Cotton area in 1995 reached its highest level in 40 years at 16.9 million acres as a result of historically high cotton prices combined with very weak prices for corn and soybeans and a 0-percent government acreage reduction program. However, high production costs and low yields from weather and insect damage reduced producers' net returns despite a continued price uptrend. Poor results from the 1995 crop and higher competing crop prices cut 1996 plantings by 14 percent from the previous year.

It appears that regional changes in planted acreage in 1996 and 1997 responded to the producer's net income from the previous year's cotton crop, or lagged net returns, and the expected price of cotton and its relationship to that of competing crops, primarily corn and soybeans. The current December cotton futures price is 4-5 cents lower than it was at this time last year. The soybean-cotton price relationship has been relatively stable since 1996, but corn prices fell in comparison to cotton in 1997 and have risen again in early 1998.

Viewed regionally, Southeastern area was almost unchanged in 1997 but is likely to decline about 250,000 acres this year to 2.9 million due to lower returns from last year's crop and higher corn prices. In the Delta, area also dropped in 1997, despite stable returns from the 1996 crop. Anecdotal evidence suggests that producers are shifting away from cotton due to its greater risks from higher production costs. If so, the trend away from cotton will intensify in 1998 with the current lower cotton prices and higher corn prices---plantings are projected to be 3.0 million, down 450,000 from 1997. Similarly, planted area in the far West is shifting to lower-cost options, especially permanent crops, although some of the loss in upland cotton will be offset by higher Pima cotton acreage in California. Western area of 1.35 million acres, including Pima, is projected.

The Southwest shows sharply higher net returns from the 1997 crop. This is attributable to historically low levels of acreage abandoned due to weather problems and good yields, which

have more than compensated for declining prices. Acreage is likely to be higher this year in south Texas, where wet conditions hindered planting last year, lower in east Texas and roughly equal to last year in the High Plains. Planted area of about 5.65 million acres, down about 100,000 from last year, is expected.

With average growing conditions, production ranging from 16.5-17.5 million bales is anticipated, including about 550,000 bales of Pima cotton. The mid-point of the range, 17.0 million bales, is nearly 2.0 million bales below 1997/98 production. Of course, these estimates are at best an indicator of direction, given the uncertainties surrounding producers' planting intentions and the extreme variability of production yields.

Probability of U.S. Imports, 1998/99

The prospect of lower U.S. area and production raises the question of whether the U.S. might import cotton in 1998/99, as it did in the summer and fall of calendar 1996. Special import quotas are authorized whenever the lowest U.S. price, usually Memphis, as quoted for the Cotlook A-index minus the A-index minus the previous week's Step 2 payment exceeds 1.25 cents per pound for 10 consecutive weeks; when Step 2 is active, as it is now, this effectively means the Memphis-A differential must rise for 10 consecutive weeks. Each week's import quota permits imports of one week's domestic mill consumption, or about 200,000 bales, with a window of 90 days to purchase and 180 days to enter the U.S. from the date the quota opens.

Experience indicates that, if Step 3 is open, the U.S. is likely to import substantial quantities of cotton only if U.S. shortages occur in the context of more plentiful foreign supplies. This is because the cost to mills of importing foreign cotton is equivalent to an average 7-8 cent differential between the U.S. and foreign price quotations, basis northern Europe. An additional foreign discount, probably 2-3 cents more, is needed to offset the mills' costs of storing large import shipments and spinning unaccustomed varieties, for a total spread of at least 10 cents per pound. The cotton imported during the summer and fall of 1996 was purchased when the Memphis quote exceeded the A-index by 7.5-15 cents per pound, and many import transactions probably occurred at the upper end of that range. Such large differentials are usually associated with tight U.S. stocks and, if anticipated early on, would tend to limit exports before inducing imports.

U.S. Cotton Mill Use, 1998/99

U.S. cotton mill consumption during 1998/99 is projected to expand slightly from 1997/98. The preliminary estimate for U.S. mill use next season is 11.7 million bales, about 2 percent above the 1997/98 estimate and twice the percentage growth presently projected in foreign cotton consumption. The U.S. mill use projection is based on the premise that GDP growth will slow to a rate of 2.5 percent in calendar 1998, compared with 3.8 percent in 1997, that U.S. retail demand for cotton textiles will rise about 6.5 percent, and that both textile imports and textile exports will reach new records. As a result, per capita domestic consumption of cotton could rise an additional pound from the 1997 level to 33 pounds.

Textile trade agreements such as NAFTA and CBI have changed the landscape of U.S. cotton textile trade over the last decade. Since NAFTA's inception in 1994, more semi-processed products are being shipped to other NAFTA/CBI countries for assembly, before returning to the United States as an imported product. In 1993, for example, the United States exported slightly less than 1 billion pounds of cotton in the form of textiles. At that time, 15 percent of the total went to Asian countries while 65 percent were shipped to other North American countries. In just four years, U.S. cotton textile exports have climbed to a record 1.8 billion pounds with most of the increase going to the North American region. Shipments to NAFTA/CBI countries have risen consistently and in 1997 accounted for 80 percent of all U.S. cotton textile exports.

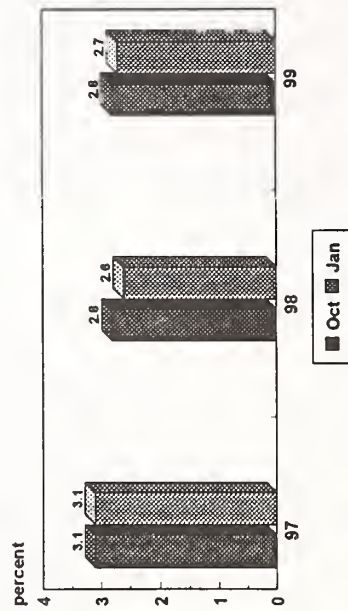
Likewise, U.S. cotton textile imports have continued to expand. In 1993, the United States imported nearly 3.6 billion pounds of cotton in the form of textiles and nearly two-thirds came from Asian countries while less than one-fifth came from other North American countries. However, in 1997, cotton textile imports soared to 5 billion pounds but the percentage coming from Asia declined to one-half. On the other hand, cotton textile imports from NAFTA/CBI countries have expanded, accounting for over one-third of the total. In fact, Mexico has been the largest supplier to the United States since 1995, and when combined with Canada, accounted for about 20 percent of U.S. cotton textile imports in 1997.

U.S. Cotton Exports and Stocks, 1998/99

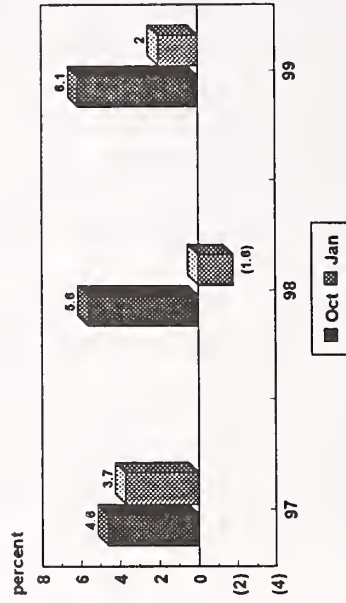
U.S. cotton exports are expected to decline to around 6.2 million bales in 1998/99, down 15 percent from the current year. Exports will be constrained by limited U.S. supplies due to reduced production, by the anticipated build-up in foreign stocks outside China during 1997/98, and by projected lower import demand, especially by China. As noted earlier, foreign beginning stocks are likely to rise substantially, especially in Central Asia, the African Franc Zone and Australia, indicating increased early-season competition; at the same time, foreign production is expected to decline proportionally less than the U.S. For these reasons, the U.S. share of world trade is projected at just below 24 percent, compared with nearly 28 percent this marketing year.

Based on these projections of supply and use, U.S. ending stocks would fall to a level of 3.3 million bales, or about 18.5 percent of total use, a relatively tight stocks-to-use ratio.

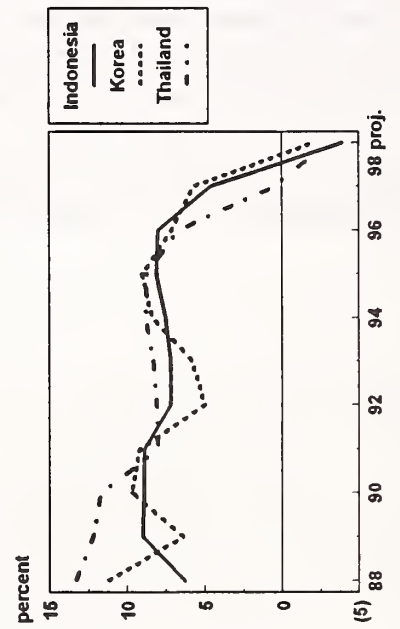
World GDP Projections Oct. 1997 and Jan. 1998



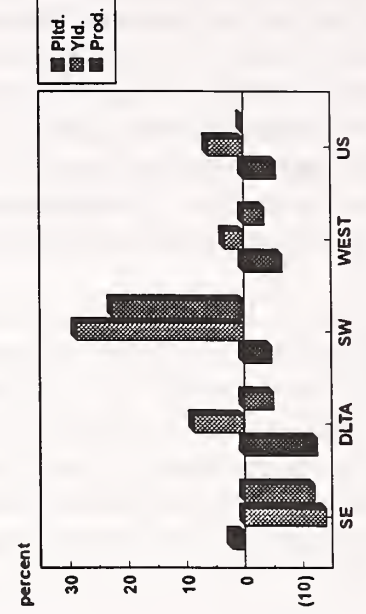
SE Asia GDP Projections Oct. 1997 and Jan. 1998



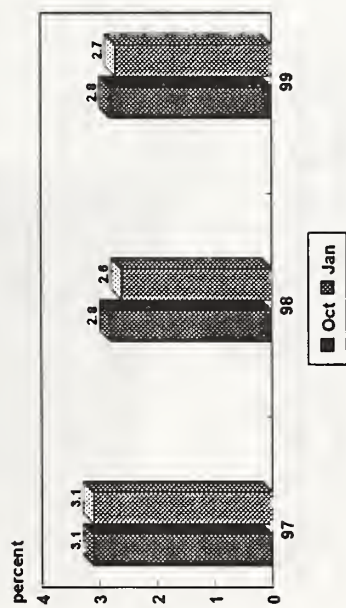
GDP Growth in Indonesia, Korea and Thailand 1988-1998



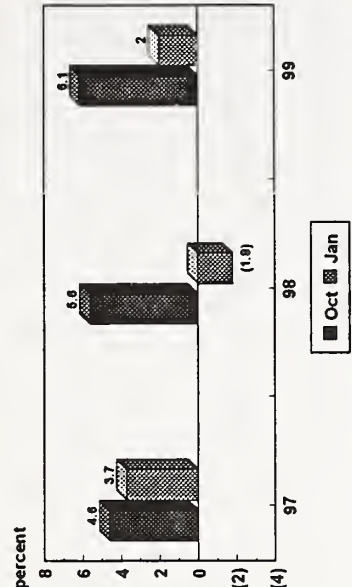
Changes in U.S. Regional Production 1997/98 from 1996/97



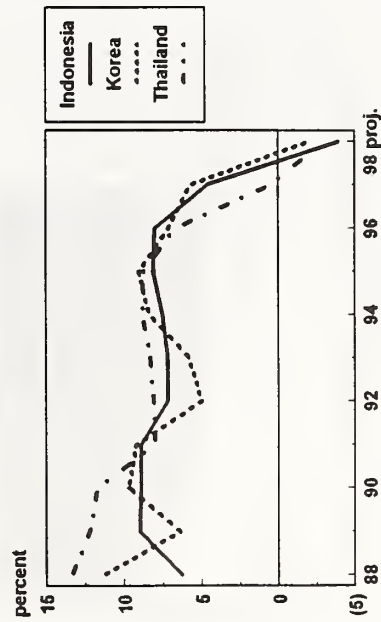
World GDP Projections Oct. 1997 and Jan. 1998



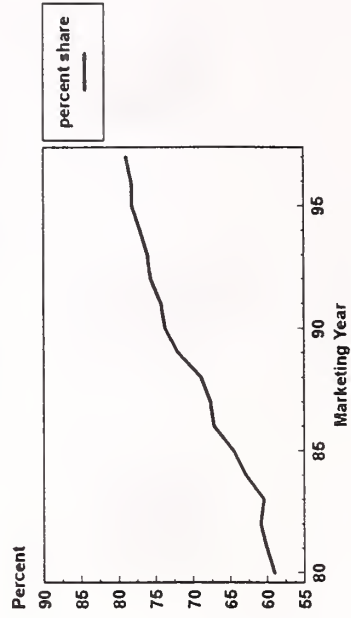
SE Asia GDP Projections Oct. 1997 and Jan. 1998



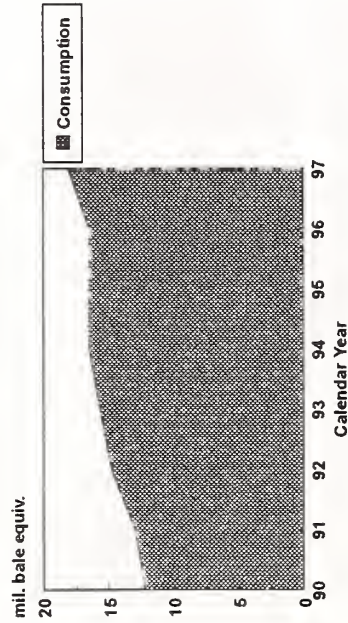
GDP Growth in Indonesia, Korea and Thailand 1988-1998



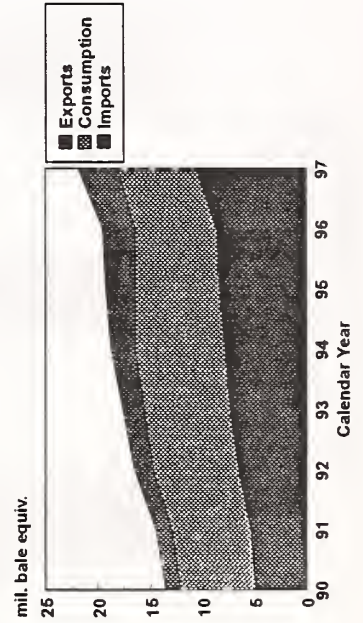
Cotton's Share on the Cotton System 1980/81 - 1997/98



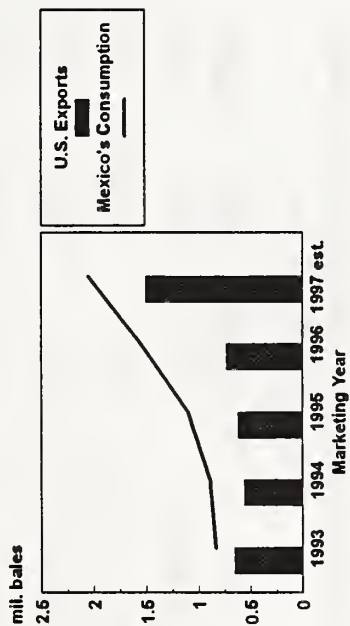
U.S. Retail Cotton Consumption



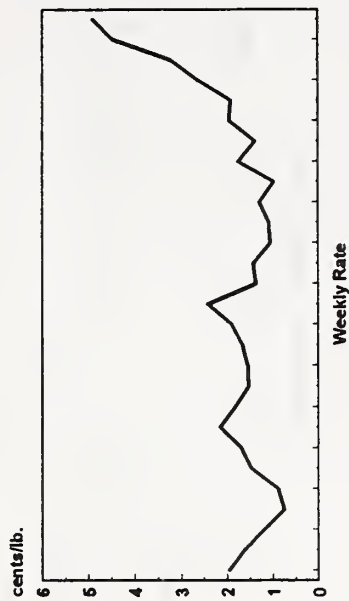
U.S. Retail Cotton Consumption, Textile Imports and Textile Exports



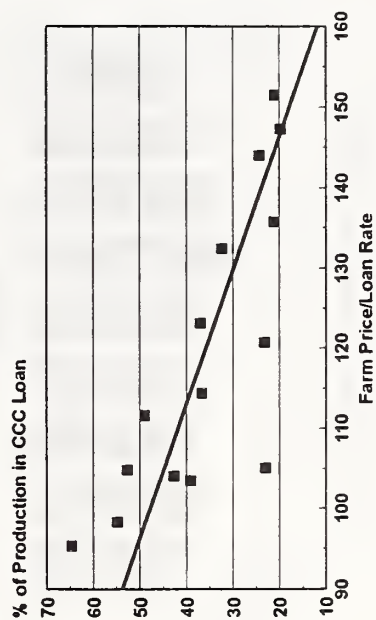
US Exports to Mexico as a Share of Mexico Consumption



Step 2 Payment Rates Aug. 1, 1997 - Feb. 12, 1998



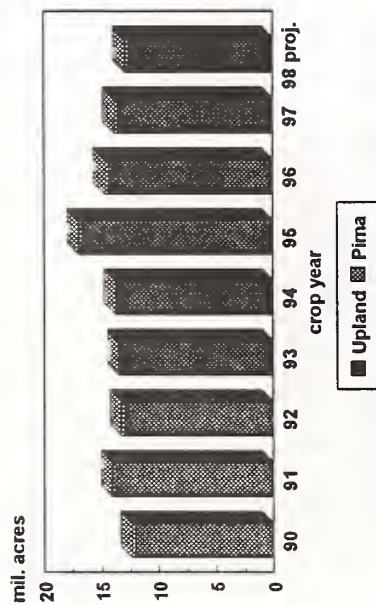
Loan Activity at Alternative Price Levels 1980-1995



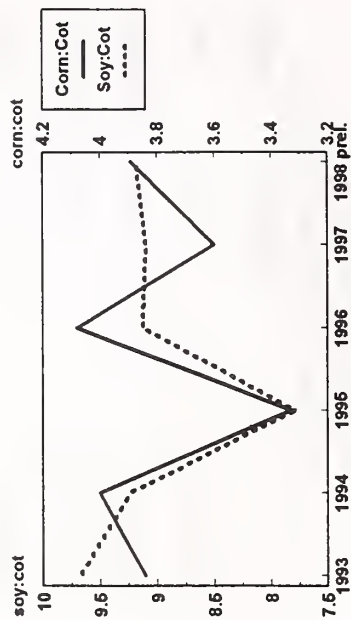
Foreign Projections 1997/98 and 1998/99 Ranges

	1997/98	1998/99
Beg. Stocks	32.4	34.1
Production	72.0	69.0-71.0
Consumption	77.8	77.5-79.5
End. Stocks	34.1	30.0-34.0

U.S. Cotton Area since 1990



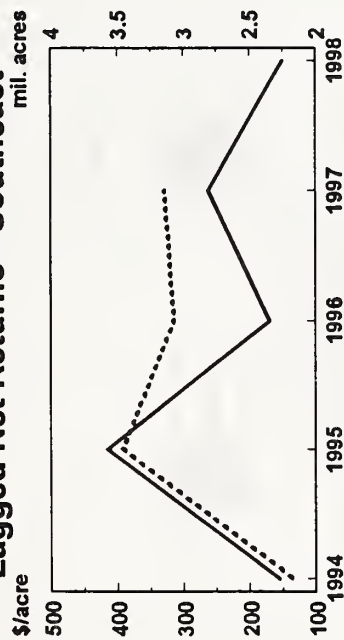
Corn and Soy Price Ratios to Cotton January-March



Preliminary Forecast of 1998 U.S. Area by Region (mil. acres)

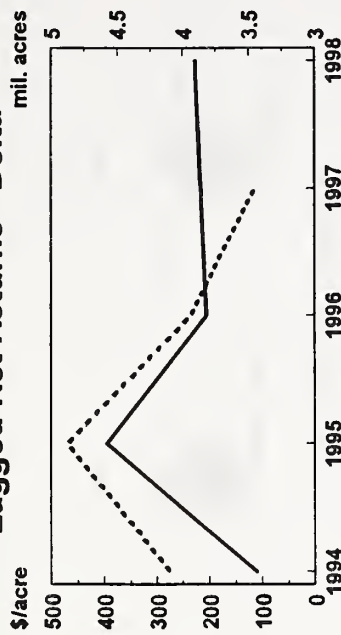
	1997	1998	Change
Southeast	3.14	2.90	-0.24
Delta	3.45	3.00	-.45
Southwest	5.76	5.65	-.11
West	1.48	1.35	-.13
U.S.	13.82	12.90	-.92

Lagged Net Returns - Southeast



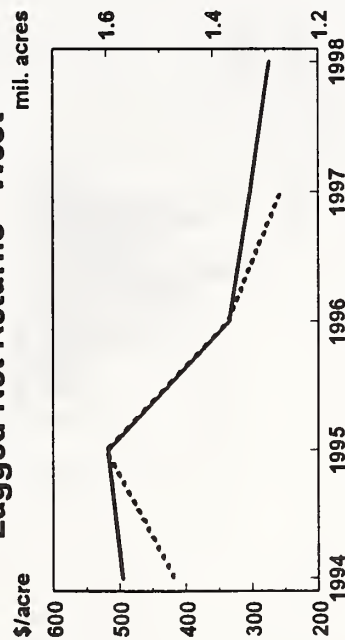
Net Returns Planted Acres

Lagged Net Returns - Delta



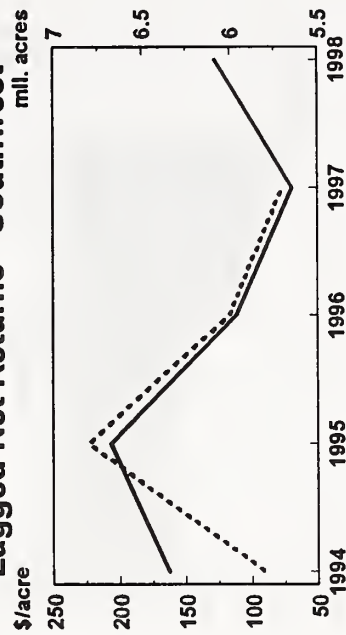
Net Returns Planted Acres

Lagged Net Returns - West



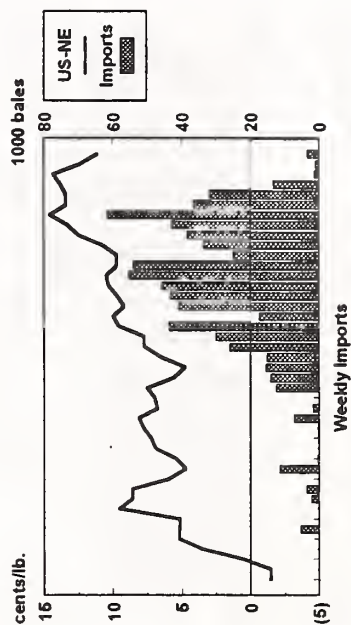
Net Returns Planted Acres

Lagged Net Returns - Southwest

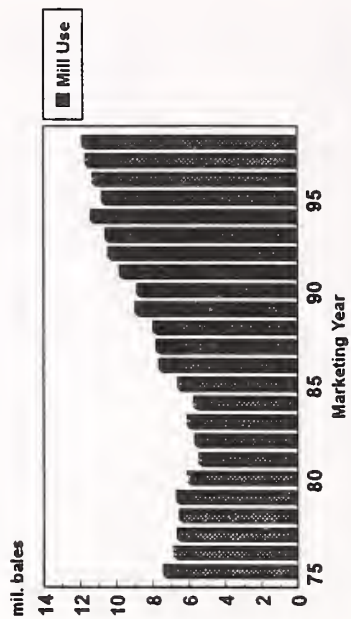


Net Returns Planted Acres

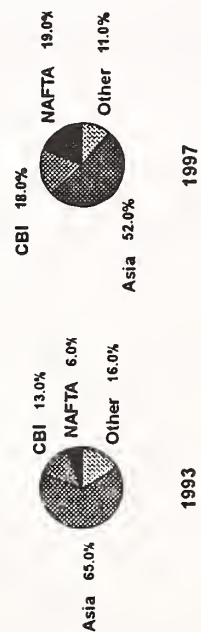
Imports and NE Price Difference Jan. - Oct. 1996



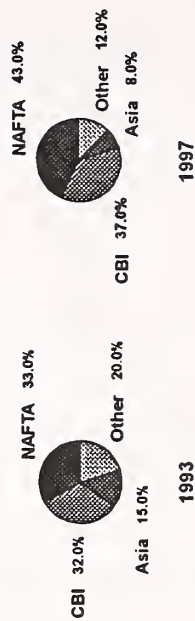
U.S. Mill Use since 1975



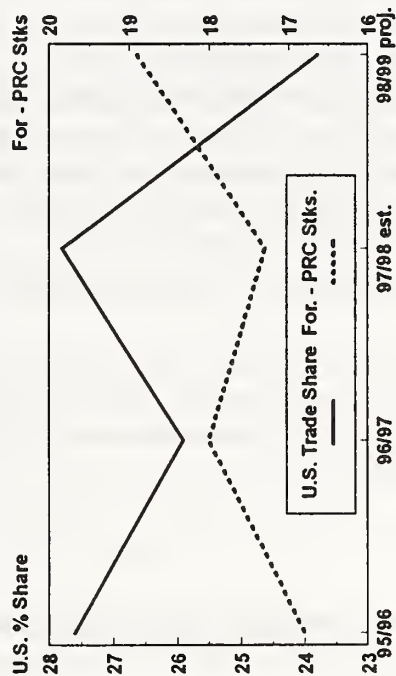
Composition of Textile Imports 1993 and 1997



Composition of Textile Exports 1993 and 1997



U.S. Trade Share and Foreign - PRC Beginning Stocks



U.S. Balance Sheet 1997/98 and Prel. 1998/99

	1997/98	1998/99	Change
Beg. Stocks	4.0	4.2	+0.2
Production	19.0	17.0	-2.0
Imports	0.0	0.0	0.0
Total Supply	23.0	21.2	-1.8
Mill Use	11.5	11.7	+0.2
Exports	7.3	6.2	-1.1
Total Use	18.8	17.9	-0.9
End. Stocks	4.2	3.3	-0.9

EFFECTS OF CHANGING COTTON TECHNOLOGY ON U. S. COTTON PRODUCTION

Phillip C. Burnett
Executive Vice President
National Cotton Council

In listening to the report just given on the U.S. and World Cotton Outlook, there is no doubt that there are many challenges for the cotton industry as well as to the rest of agriculture. With world fiber production capacity outstripping demand, we are once again reminded to look at the fundamentals of how we can continue to be the most reliable supplier of high quality cotton for markets around the world. Over the past year the National Cotton Council president has carried the banner for new cost saving technologies. However, we were quickly reminded by our farmers that they already are doing everything possible with existing tools. We also were reminded that margins are getting tighter and tighter. These factors strengthened our resolve to develop and adapt new cost cutting technologies.

I am one of those who believes that there are opportunities for additional efficiencies provided we continue a strong research focus. I believe we can keep the U.S. cotton industry as the premier competitor for fiber markets around the world.

Most are well aware of the promotional efforts led by Cotton Incorporated and strategies to increase export demand led by Cotton Council International. But while we are working collectively to increase market and consumer demand (and, by the way, demand for cotton apparel and home furnishings has never been higher), we are reminded to work on our margins. Textile mills are being squeezed by apparel and home furnishings retailers due to excess retail shelf capacity. In turn, prices paid for raw fiber are low and indeed in many cases barely more than the cost of production. Fundamental economics dictate that textile mills must make a profit in order to purchase cotton, and producers must have incentives to supply the raw materials.

For a farmer, cost can be affected two ways -- increase yield or decrease cost. Better yet, do both at once.

Can we really expect technology to help us reduce cost? I am one of those who believes we can. As we look for new opportunities, I think it is appropriate to first look at some of today's tools that at one time seemed impossible.

A Backward Look

Take labor, for example. At the end of World War II, 175 man-hours of labor were required to produce a bale of cotton. In 1996, LSU economists reported only 3 man-hours per bale.

In 1950, spindle pickers harvested only about 5% of the U.S. crop. It took 12 years before the industry moved to the 50% level. But interestingly enough, it took 150 years from the time the

cotton gin was invented to the time we started using mechanical pickers. The point is that the time of creation of an idea to commercialization is narrowing.

In 1958, researchers at New Mexico State University investigated a concept of baling seed cotton. A far-out idea at the time. Researchers were foreseeing the time that we would have a bottleneck at the cotton gin as mechanical improvements in harvesting evolved. By 1997 modules were used on about 75% of the U.S. crop.

Insect management control DDT was the first really broad spectrum insecticide, being introduced around World War II. But by 1972 bollworms were so resistant to DDT that the chemical was no longer effective. Later, along came pyrethroid technology, an effective tool which we first began to investigate in the early seventies. The importance of pyrethroids is nearly legend.

Weed control Prior to the 1960's, cold steel in the form of the cultivator sweep and the hoe were the "chemicals" of choice. Treflan, one of the first effective grass control herbicides for cotton, was commercially introduced in 1964, and what a dramatic breakthrough! In 1998 we have access to over-the-top broadleaf herbicides and use of cotton plants that have been genetically engineered to make them tolerant to materials such as Roundup. Buctril also will be available once EPA approves a tolerance.

Areawide insect management Prior to 1978, areawide boll weevil eradication was a term many talked about, but had a hard time believing. But starting with a trial in 1978 the concept was proved, and by 1995 the Southeastern U.S. returned to cotton. Acreage now has nearly quadrupled to over 3.0 million acres. Most of that turnaround can be attributed to boll weevil eradication.

U.S. yields In the early fifties, beltwide yield averages were about 350 lbs./acre. By the nineties the 5-year average is almost 650 lbs., and in 1997, yields were over 730 lbs. per acre nationwide.

Biotechnology Ten years ago many people thought biotechnology at best was an interesting and curious phenomenon in the laboratory. But in 1997 the U.S. planted about one-fourth of its crop in transgenic cotton -- Bt, BXN, and Roundup Ready varieties, to be specific.

So what have we learned from this backward look -- from visions in reverse? First, I think we can agree that there was not one single silver bullet. Second, there have been many incremental improvements and most technologies which we take for granted today were hard to imagine before they were developed. Third, based on our past experience, we will be depending more and more on **integration** of many components of chemistry, engineering, and computer technologies into a well focused, efficient management system.

Now back to the future! What are the future technologies that we anticipate being major contributors to our industry?

Computer technology We hear a lot about precision agriculture, especially with computers being more powerful and less costly than ever before. One of our technical staff made the observation

that the average automobile from Detroit today has more electronic computing capacity than that of the lunar landing module in 1965. We heard a recent report on NPR that something like 37% of all households in the U.S. have personal computers, and I would venture to say that among us in this room today the percentage is much greater. Adaptation of computers on farms for communications, data collection and risk management are accelerating, and in our organization the internet is a major tool of communication. We are now hosting a peer reviewed Scientific Journal available only electronically.

Conventional plant breeding No one should discount the role of conventional plant breeding as it will continue to be extremely important. Our industry will insist on strong conventional breeding programs to serve in concert with new plant biotechnologies. With focus and resources, we should expect varieties to continue to improve from 1-2% genetic yield potential per year, as they have historically. Breeding is essential to genetic diversity to assure that all varieties are not first cousins of one another.

Transgenic cottons We've heard about Bt and its toxicity to bollworms. But what about other transgenes for boll weevil, plant bugs, and aphids? Our information tells us that those transgenic technologies could be available. Disease and nematodes are costing the cotton industry nearly a half billion dollars a year. The potential for cutting those losses through genetic engineering exists but may again require public involvement.

Transgenic yield improvements What about yield increases through transgenic technologies? We understand yield is not controlled by a single gene and is complex. Nevertheless, cotton scientists are looking for breakthroughs that will provide significant new levels in yield -- even more so than the 1-2% we should expect from conventional breeding. Additionally, we should expect improvements through better ripening, uniform maturing, and earlier fruit setting. We may need a plant to set fruit earlier and be picked in the middle of August rather than in September or October when harvest conditions begin to deteriorate. The cost of development and return to the seed breeder may be the greatest deterrent to these technologies. There may be a growing role for the public sector in these areas of high risk, low return (to private company).

Chemical technology Chemical technology has been very important to the success of this industry and it will continue to be. Targeted, more selective and safer insecticides are being developed and tested. Most of the new materials are soft on beneficial insects which is a plus. But, unfortunately, increasing regulations and cost of registration are pushing the cost of new chemistry to the point we can barely afford it.

Fiber quality Fiber quality is more important now than ever as the competition for market heats up. Our recent experience in improving length by more than 15% in the past 15 years is a great success story. Can we do more? Can we match the strength of polyester? Perhaps we can. For example, a technical paper was presented at our conferences last year that scientists have developed a polyester-like polymer which is included in the cotton fiber itself. This is a far-out finding and a long way from commercial use. But it's an example of the type of value-added traits that genetic engineering offers.

Engineering systems One of cotton's bottlenecks is with the harvester. We plant cotton in a week, but sometimes it takes a month or longer to harvest. As in Georgia right now, there are fields of 1997 cotton that were never harvested. This research is taking on a new focus and there is good evidence that equipment manufacturers are actively addressing this bottleneck.

Sensors Existing technology can be used to develop electronic recognition systems to determine the difference in the shape of a cotton leaf from that of a weed. This will allow targeted spray applications. Consider the savings when we apply the chemical only on the targeted plant and not the ground and cotton in the vicinity. While this seems to be a far-out idea, it is my understanding that the basic technology exists in weapons and defense systems. While this space-age technology at today's cost is expensive, it may have opportunities for agricultural applications. Perhaps a modern version of "swords to plowshares."

Cultivators are being integrated with sensor technology so that unwanted plants are removed mechanically. We have seen demonstrations of weeds between adjacent cotton plants being removed. This can be done 6 rows at a time at 6 mph.

Precision agriculture The fundamental principle of precision farming is that site specific information will provide us with ways to manage within-field variability. Our foundation funded one project last year that showed more than a 100% variation in different parts of the field, even though from the turnrow the field appeared uniform. Precision agriculture is one of the things that will help us understand what is going on in that field and when and how to take action.

What are the requirements or characteristics of new technology? Understanding that technology will cost something, the first requirement is that it must be profitable. We can't continue to simply swap dollars. Many cotton farmers have reason to believe that commercial developers of new chemistry, genetics or equipment must allow more of the benefits to accrue to the farmer. Finally, a very important requirement is that technology must be user friendly. Too often new ideas are so complex that they can't be used.

Summary In conclusion, we know that technology has been good to agriculture and to the public at large. We have a good track record and have a commitment to continue. But it requires that we maintain our focus on the objective -- profitability. With the understanding that new technologies mentioned above could potentially decrease our production costs by as much as 10 cents a pound, we have a target. But it won't happen without a concerted effort to support the public research community, strengthen our own research and educational programs, and build partnerships with our allied industries.

COTTON CONSUMPTION TRENDS IN LATIN AMERICA

Paul A. Ruh
President, Paul Reinhart, Inc.
Dallas, Texas

Ladies and Gentlemen:

When the U.S. Congress passed the NAFTA treaty in 1994 our relations with our two next-door neighbors entered into a new era. The U.S. formally recognized that Mexico and Canada were of special importance, and therefore deserved preferential treatment. Especially Mexico, with its population of about 92 million.

As far as cotton is concerned, Latin America has a very mixed history. Since before W.W.II, and through the early 90's, Latin America was predominantly a producer and net exporter of raw cotton, (Exhibit #1) particularly Mexico, Central America, Brazil and Peru. During this decade, Latin America's raw cotton trade has undergone significant changes; it is now a net importer of over 2 million bales per year (Exhibit # 2). Although Latin America has had a textile industry for a long time, mostly in Mexico and Brazil, it used to be of lesser importance in the global picture. Total cotton consumption was only 2.0 million bales in 1950 and 4.8 million bales in 1980. For 1997/98 it is estimated around 7.5 million bales (Exhibit # 3) or about 8.5% of total world cotton use. On the other hand, cotton production in the region has dropped from its high of 8.2 million bales in 1990/91 to 5.8 million bales this year (Exhibit # 4). What are the reasons for this drop in production? In Mexico and Brazil, growers have received only sporadic support from their governments in recent years, and they have simply turned to more profitable crops, whereas Argentina has invested heavily in cotton's infrastructure and as a result production has risen sharply.

The outlook for cotton consumption in Latin America is good. Led by the two main consuming markets, Mexico and Brazil, I expect that cotton use will increase in excess of 30% over the next five years. This is good news for American cotton farmers who can expect to see continuous and rising demand for U.S. cotton in Latin America, especially in Mexico and Central America.

Let's look at the various markets in detail:

MEXICO:

The Mexican textile industry has benefited strongly from NAFTA. Cotton use was between 525,000 and 875,000 bales per year from 1980 through 1994. Since then, consumption has more than doubled to an estimated 2.1 million bales in 1997/98. In fact, I feel that Mexico's mill use may reach as much as 2.4 million bales in 1998/99 (Exhibit # 5). With a domestic crop estimated this year at 870,000 bales, the bulk of the consumption will be imported. At least 90% of all cotton imports originate in the U.S., the rest comes from South America and maybe West Africa. I prefer not to say that Mexico is a captive market for U.S. cotton, as this might imply a

dangerous complacency. But, the fact is that U.S. cotton has several advantages that other origins simply cannot match. First of all, there is the geographic proximity to the world's largest exporter, meaning not only lower transportation costs and "just-in-time" delivery, but also the widest possible selection of qualities, from short staple, low grade cotton to the finest ELS. Second, every U.S. bale has HVI (High Volume Instrument) class, a feature that the Mexican mills have learned to appreciate, particularly when using Cotton Inc.'s EFS (Engineered Fiber System) technology. Furthermore, some U.S. retailers demand that their products be made of U.S. fiber, not just any cotton. Finally, there is the GSM program, which makes short to medium-term credit available to the Mexican mills at U.S. interest rates. In a country where local rates tend to be high, this is a very important tool.

Mexico has always had the advantage of much lower labor costs compared with the U.S. But, only after NAFTA caused most import tariffs to disappear has the cost advantage come strongly into focus. Mexican mill owners have invested heavily in increasing and up-dating their facilities. U.S. manufacturers have recognized Mexico's potential and entered into partnerships with Mexican companies or are opening up their own production facilities. Textile companies from Taiwan and Korea are doing the same in order to be able to take advantage of the huge U.S. market. Of course, the cost advantage is most pronounced in apparel production, which is very labor-intensive. There are numerous apparel plants which convert U.S.-made textiles into garments that are then shipped back to the U.S. market. Other U.S. garment manufacturers have begun to out-source production to Mexico. Another advantage of the proximity to the U.S. comes into play here: Quick changes in fashion, seasonal or others, be it in color, shades, styles, weight or size of any garment can be made and put back on the U.S. retailers' shelves in less time than from anywhere else outside the U.S.

The industry has gained enormously from NAFTA. This is a textbook case of what a free-trade agreement can do for the countries involved. In both the U.S. and Mexico, cotton consumption has reached record levels. In other words, it cannot be argued that the expansion of Mexico's textile industry has come at the expense of the U.S. mills.

At present, the export market is strong but the domestic market has been difficult since 1994 and is improving only very slowly. In addition, Mexico's textile industrialists are worried about the turmoil in Asia. Mexico has no import quotas for textiles, so the potential for a flood of cheap garments cannot be dismissed. Still, looking ahead, I am convinced that cotton use in Mexico will increase by as much as 10% per year over the next five years. This could result in an annual cotton consumption approaching 3.5 million bales by 2002/03 (Exhibit # 6). The growth is almost entirely export-related. What could threaten this booming industry? If Central American countries were to be granted C.B.I. (Caribbean Basin Initiative) parity, Mexico would cease to be the low cost producer of the area with the result that some of Mexico's consumption, and potential new investments there, would be shifted into Guatemala, Salvador and other countries.

BRAZIL

Brazil is a typical example of a traditional net cotton exporter gradually turning into a net importer and is unlikely to return to its former prominence as a cotton producer and exporter. Since 1980/81, Brazil's cotton consumption advanced from less than 2.6 million bales to 3.7 million in 1996/97. Due to poor business conditions in the past six months, consumption in 1997/98 is expected to be down somewhat.

There has been a distinct relocation of the textile industry from the south to the northeast. The northeastern states provided generous tax advantages, resulting in some very large mills being set up in the area. In fact, the top three northeastern mills, all denim producers, account for over 40% of Brazil's cotton use. In contrast to Mexico, the growth of Brazil's textile industry is mostly based on the domestic market, which today represents 80% of the consumption.

At this time, the Brazilian industry is also concerned about the economic problems in Asia and the prospects of cheap imports. On the other hand, with a presidential election coming up, money is likely to flow more freely, and textile consumption should pick up. I am estimating Brazil's consumption for 1998/99 at around 3.8 million bales, up nicely from this season's 3.5 million bales (Exhibit # 7).

The outlook is for a continuation of growth in cotton consumption. I project an average growth of over 3% per year for the next five years to 4.3 million bales. Brazil's cotton consumption has a great potential: It already has the installed capacity to process about 4.5 million bales. Even a small increase in the per capita consumption of its 160 million inhabitants would produce a large boost. Brazil has cheap labor and energy, almost unlimited water resources and, finally, can cover all its cotton requirements from its own production and its Mercosur neighbors around the corner, Argentina and Paraguay. Regarding non-Mercosur imports, U.S. cotton does not have a natural advantage in this market. It must fight against fierce competition from West Africa and Central Asia. What are the limitations to Brazil's growth in cotton consumption? The strong need for modernization of the industry, a still missing reduction in cost through a tax reform and export incentives by means of a more flexible exchange rate policy, and the aggressive competition from Mexico in many of Brazil's important export markets, principally the U.S., Canada and Europe.

ARGENTINA

Argentina is the third-largest cotton consumer in Latin America. Annual consumption is running around 500,000 bales. The highest level was 650,000 bales in 1990/91. In contrast to Mexico and Brazil, there is no up-trend in cotton use; it has been essentially flat for the past five years (Exhibit # 8). The country's population is not large enough to sustain a large cotton consumption. Also, contrary to Mexico and Brazil, cotton production has been increasing rapidly. From less than 850,000 bales in the early 80's, Argentina has now reached an annual production level of over 2.0 million bales, making increasingly large amounts of cotton available for export. At this time I do not see an increase of cotton consumption in Argentina.

OTHER MARKETS

CENTRAL AMERICA

Close to home, we have the small nations of CENTRAL AMERICA. As I already mentioned, Central America used to be a major supplier of cotton to the world market. Today, there is practically no cotton production left in the area. But, the textile industries in Guatemala and Salvador have expanded to the point where these countries are now important customers for U.S.-grown cotton. Mill use in Guatemala runs about 135,000 bales and Salvador about 125,000 bales per year (Exhibit # 9). Both countries are expected to increase consumption in the years ahead, maybe about 5% annually. The textile people are hopeful that their countries will soon be granted C.B.I. parity or one day be admitted into an expanded NAFTA. Either would put their

mills on a more level playing field with Mexico and greatly improve the cotton consumption potential of this region. Apart from Guatemala and Salvador, only Honduras, Costa Rica and Nicaragua have very small textile activity at this time.

ANDEAN PACT COUNTRIES

The Andean Pact is a free-trade organization whose members are Colombia, Peru, Venezuela, Ecuador, and Bolivia, with a total population of about 103 million people. Since regionally produced cotton is not always available, U.S. cotton has a good shot at the business in some of these markets.

COLOMBIA used to be an important cotton producer. Cotton consumption has been quite erratic, rising from 250-275,000 bales in the early 80's to about 450,000 bales in 1990/91, and around 350,000 bales at present. U.S. cotton has a chance if it is priced competitively. The industry has modernized somewhat, but much more needs to be done in order to improve productivity and, consequently, the volume of consumption.

PERU is one of the world's oldest cotton-producing countries. Its fine ELS-type cotton, Pima, is well known. Cotton production in Peru has declined, but consumption has been increasing slowly over time, reaching about 300-325,000 bales in recent years. I feel that Peru's consumption will increase steadily over the next few years. The creative approach to marketing their high quality fabrics and garments in the U.S. and Europe will allow its industry to grow.

VENEZUELA uses about 175-200,000 bales of cotton per year, and this has not changed much in the past decade. Domestic production covers less than half of their consumption. The country is a small but steady buyer of U.S. cotton. I do not expect to see much change in the rate of cotton consumption in the years ahead. ECUADOR and BOLIVIA are small consuming countries that may reach 100,000 bales in five years. Ecuador has imported limited quantities of U.S. cotton in recent years, and should continue to do so (Exhibit # 10).

OTHER SOUTH AMERICAN COUNTRIES

This leaves us with CHILE, PARAGUAY and URUGUAY, with a total annual consumption of about 200-225,000 bales. Chile has a small textile industry, which obtains its cotton mostly duty-free from South-American suppliers. U.S. cotton faces a 11% import duty. The granting of NAFTA parity could change things rapidly. Otherwise, Chile, being an associate member of the Mercosur customs union, is expected to become a full member by the year 2006. I cannot see an increase in its consumption until NAFTA parity is a reality or when Chile will be able to "free trade" with Brazil and Argentina, the dominant members of the Mercosur. Paraguay is a major cotton-producing country, with only a small domestic spinning industry (Exhibit # 11).

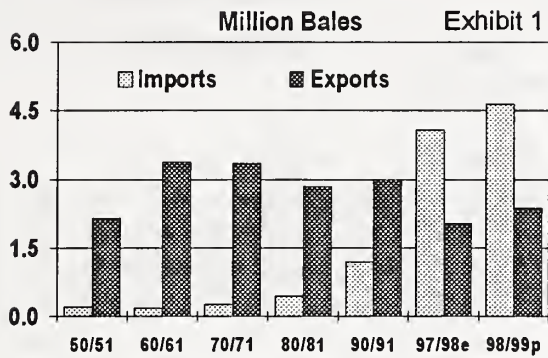
SUMMARY

To sum up, cotton consumption is clearly in an up-trend, led strongly by Mexico and Brazil. The granting of C.B.I. parity, extending NAFTA, or the implementation of other free trade agreements with the U.S. would boost cotton consumption in the respective countries, just as it did for Mexico, which has greatly benefited from the free access to the huge consumer market of the United States. Latin America is a significant market for cotton. U.S. raw cotton has a definite advantage in Mexico and Central America, and must fight for market share in the other countries.

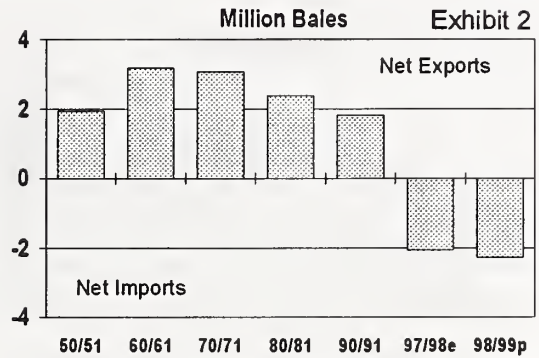
I am projecting Latin American cotton consumption to increase by about 30% over the next five years, from 7.55 million bales in 1997/98 to 10.0 million bales by the year 2002/03 (Exhibit # 12). At this time, I do not see polyester as much of a threat to cotton consumption in the region. Polyester production in Latin America is small and therefore relatively expensive.

What else will change over the next five years? Inter-American alliances will be formed and mergers/joint-ventures will increase between the large U.S. manufacturers and their counterparts in Mexico and Brazil. Both these countries have two significant advantages over other cotton consuming countries of the world: close access to very competitively priced raw cotton, U.S./Mexican cotton in the case of Mexico, and Brazilian/Argentine/Paraguayan for Brazil. Furthermore, both countries have cheap labor. Considering that the cost of raw cotton represents over 60% and labor about 10% of the inputs that go into a heavy-weight denim fabric, these are very significant advantages!

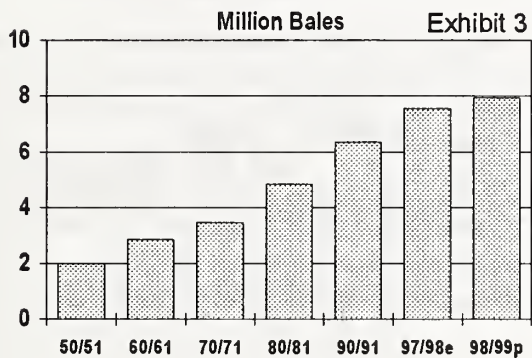
Latin America Cotton Trade



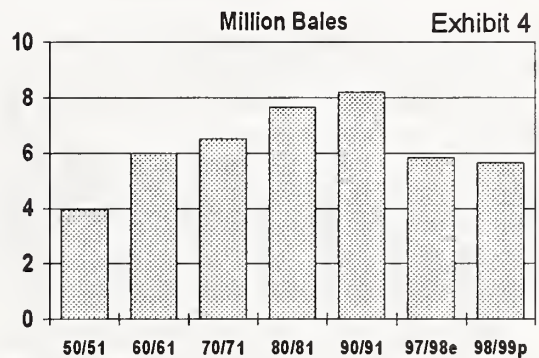
Latin America Cotton Net Trade



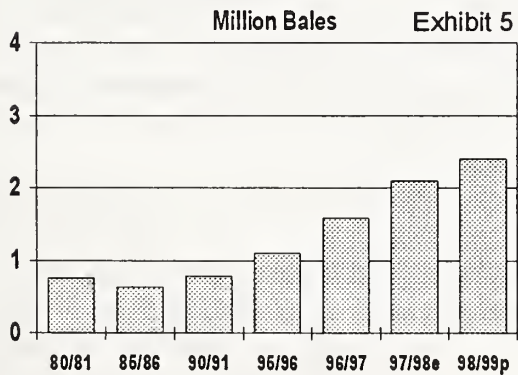
Latin America Cotton Consumption



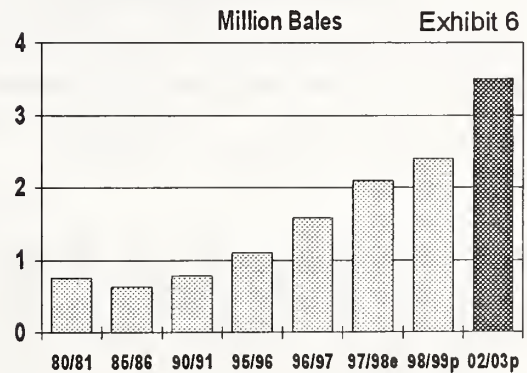
Latin America Cotton Production



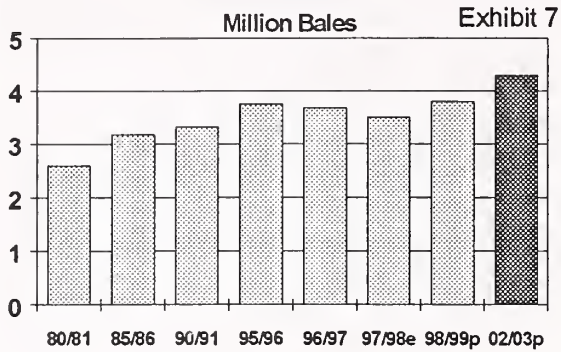
Mexican Cotton Consumption



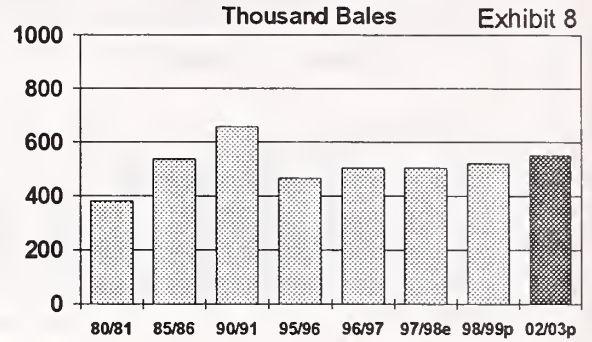
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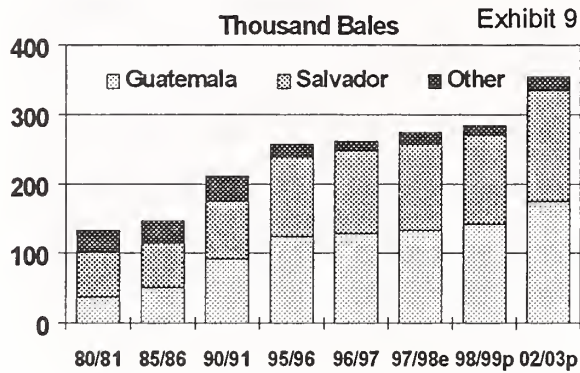
Brazil Cotton Consumption



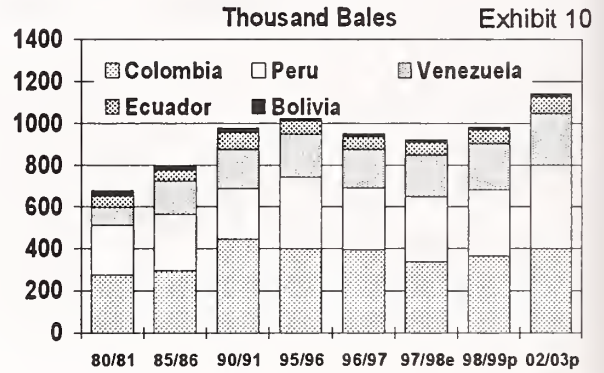
Argentina Cotton Consumption



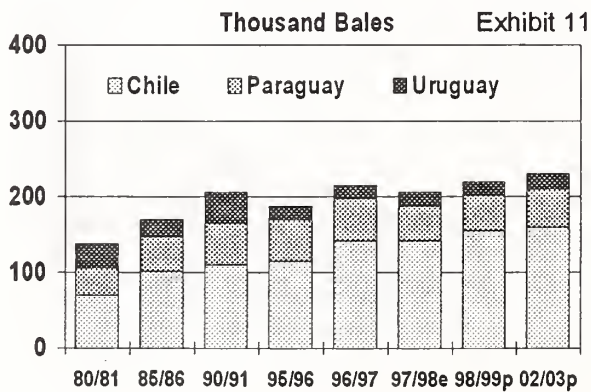
Central America Cotton Consumption



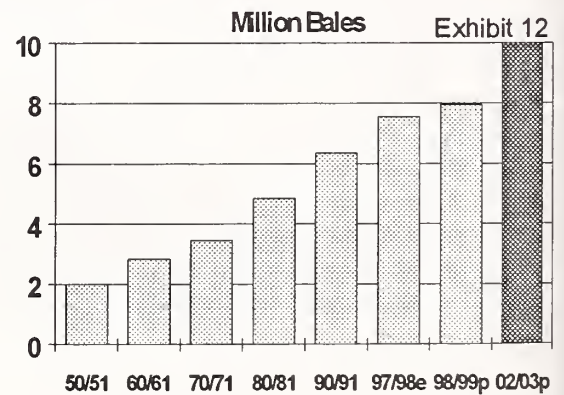
Andean Pact Cotton Consumption



Other South American Countries Cotton Consumption



Latin America Cotton Consumption



Source: ICAC, Paul Reinhart

The New Asian Cotton Situation

Clyde Davidson
Vice President of Research, Allenberg Cotton Co.

In 1986, commodity markets were rocked by measurements of a plume of radiation moving to the northeast from the site of a nuclear power facility at Chernobyl in the Ukraine. The western news services ran headlines that the China Syndrome had quite possibly occurred.

It was in the early Spring, and analysts were busy calculating how much of the Soviet Union's food supply was irradiated, and how much land would be forever unharvestable. When the cloud moved east, some analysts started including Eastern Europe in the calculations. One forecaster reported 20 to 25 percent of the Soviet winter wheat crop had been contaminated.

Big events introduce uncertainty into the market-place, and the job of research is to apply knowledge to the situation to ascertain the most likely outcome so that other people can make informed decisions on what to do.

I remember when I got asked about Chernobyl and its impact on cotton, and it was by someone who was clearly thinking he needed to be making decisions. Markets were in upheaval, cotton included. What I said was that it would be like a melt-down on the U.S. west coast affecting the cotton crop in Mississippi.

Analyzing big events isn't always that easy. And the Asian crisis is surely a big event for many markets.

Two of the questions posed by the recent collapse of currency and equity markets in Asia are how it will affect the United States and how it will affect China. Since these are the two largest cotton-producing countries in the world, these are the topics I have chosen to focus on today at this cotton forum. I will also offer some views on why the Asian crisis occurred and what it and the changes going on in China mean to the world's commodity economy. In the process, I'd like to share some observations about how to approach commodity research when analyzing such a major event and evaluating its present and future impact on a market.

Impact of the Asian Crisis on the U.S. Cotton Situation

Analyzing and forecasting how the recent events in Asian currency and share markets will affect the future is the type of problem that poses the greatest of challenges for research. In order to be competent in this work, a person has to specialize to a considerable degree. Across their provinces, the specialists are not always consistent with one another, yet each is quite sure of his own outlook within his own discipline. So specialized do we become that it's often hard to recognize the inconsistencies. The popular circulation of views - not only in the media but also in

the material compiled in the investment community - has to be quite general in order be assimilated by its audience. And specialists often have to rely on that material to see beyond their particular discipline.

The popular assumption is that the underlying specialists know what each other is talking about, when in reality it's an Alice in Wonderland situation, where different contradictory truths co-exist. The problem is that there's too much that we simply don't know.

Events like the Asia crisis are challenging for analysts because they are too big to ignore and they *require* a person to step outside of his specialty and formulate some assumptions. If much of what people are saying is quite possibly wrong, this is risky work on which to depend, which is what makes it such a challenge.

Sometimes a fortuitous event occurs that allows one specialist to recognize the mistake of another, and this is an enormous help when it happens. It steers the analyst when he is required to reach outside of his specialized knowledge to form his convictions. For me, it occurred early in the development of the Asian crisis.

This happened upon the release of the U.S. Merchandise Trade Statistics report last November. It was the regular monthly release of U.S. foreign trade from the Department of Commerce. The U.S. trade deficit widened sharply from \$9.5 billion the previous month to \$11.1 billion. U.S. exports to the Pacific rim fell by \$1 billion and imports from the same region rose by \$1.3 billion. Some financial analysts commented on how the Asian crisis was beginning to hit the United States.

One problem with that analysis is that these numbers are two months old when they're released. This was the data for September. Any cargos coming in would have left at least three weeks earlier, probably even longer ago. And goods both coming and going would have been bought as much as months earlier. Whereas except for Thailand, these markets only started crashing in September and October.

The analysis that was going around the financial markets was very nearly impossible.

In fact, it's typically months before these types of effects become visible in our statistical reports. Business has an inertia to it; people who invest capital in plants and equipment and human resources do not want to adjust production schedules too readily, and lead times exist between sale, production, and shipment, let alone the act of transportation.

Having taken the risk to talk about unlikely results in the observations of financial analysts, let me step back within my own specialty. Any flood of cheap Asian imports is probably yet to come, if it ever does. What causes me to say this about Asia is first and foremost its new cotton situation.

What is wrong with this picture? On the one hand, the macro-specialist seems quite sure of a coming drag on the U.S. economy, caused at least partly by the surge of cheap imports, of which textiles and apparel must surely figure prominently. On the other hand, look across the

community of cotton analysts and what is the outlook for cotton demand in the affected Asian countries? Unanimously, I think, there will be declines, in some cases major, in some cases minor, but unanimous declines.

What has been the impact on the cotton market?

Despite a very heavily sold U.S. cotton export position at the present time, difficulties in the affected Asian markets, most of which are major customers for cotton, have been partly responsible for a decline in the cotton market, creating potential client-risk problems in those and other markets as well. Meanwhile, these are the traditional customers of Australian cotton, where a record crop is in prospect, a major portion of which is unsold. These problems are compounded by another record cotton crop down in Argentina, the bulk of which also needs a home in the export market.

Yet to be seen, I think, is how the tight cash flow in these countries backs up on Pakistan, and to a lesser extent India, both of which are major exporters of yarn and fabric to other Asian countries for further processing. This is only beginning to be a problem.

So far, this has been the impact of the Asian crisis on the cotton market. Longer term analyses depend on the impact of currency devaluation on trade flows, so let me return to why I see a major inconsistency between what the macro-specialists are saying and what I see happening to the Asian textile and apparel industry.

How can the unanimous view of a drop in Asian cotton demand be squared with an expansive growth of cheap Asian textile and apparel exports?

Those who wish to validate both outlooks may qualify the analysis by attributing the drop in cotton use to falling demand from the newly impoverished domestic populations of these countries. But these cheaper currencies do not go so far in buying dollar-denominated cotton, and the entire rationale of running a business using cotton in these countries has been brutally interrupted. For the people who are not cotton specialists, I should explain that due to climate and unsuitable land, there is very little domestic cotton production in the affected countries. And I should also explain that in international trade, cotton is valued in dollars. If a producing country experiences a currency decline - such as Australia most recently - nothing happens to the U.S. dollar value of its cotton in international trade. It's worth what cotton is worth on the world market.

And there is another irrefutable problem in the prospective "flood of import" analysis. We have substantial country-specific and item-specific barriers to entry to the United States in the form of a quota regime for textiles and apparel that is still very much in place. Being cheap does not gain the right of access to this market, having quota does.

If quota is under-utilized, there may be some prospect for import growth, but think about what this entails. Is there a market for the goods? Are they suitable for this market? Can the manufacturer source raw materials, pay his laborers, and maintain adequate cash flow for the

increased business? Are there trusted supplier relations with a U.S. distributor who believes in the manufacturer's capability for the product? These are the realities of doing international business, and these programs - especially for unique, non-commodity-type goods like apparel- can take a long time from inception to fruition.

For all of these reasons, I am not much moved by trade flow arguments from the Asian crisis, at least insofar as the textile and apparel industry is concerned. In addition to the new cotton situation in Asia, knowledge of business and how it happens makes the analysis theoretically unappealing. But finally let me come back around to what I call the first rule of forecasting: first assume the future will look at least somewhat like the present.

What are business conditions like in Asia today? There is illiquidity in the banking system. Difficulties exist in getting letters of credit opened. Business conditions are bad. These companies are having difficulty performing on existing contractual commitments. It's going to be a long time before they can take advantage of a cheaper labor cost. Inflation (which in Indonesia is now around 25%), rising prices, and subsequently rising wages may mean you never reach the long term view.

It is a huge leap from current conditions to a growth in business and a rise in manufacturing output. There are a hundred things that could happen between the now and then.

As someone whose work is mainly in the field of commodity economics, I do have a short-term focus in my forecasts. My job is primarily to understand the present situation and recognize the turning points as they occur, or with luck a little before. The trade impact theory may be perfectly reasonable to someone accustomed to working with a longer-term outlook. The problem with that is you rarely get to the long term.

Understanding the short term and long term impact of the Asian crisis are actually quite similar tasks, because of the first rule of forecasting. For example, in my outlook for U.S. domestic cotton use for both this year and through the 1998/99 season, the Asian crisis is not much of a factor for all the reasons cited. Better to focus on Mexican trade flows in that regard. This brings me to the second rule of forecasting: spend 95 percent of your time trying to understand the present.

Unfortunately, you can't be too sure that what you know about the present is accurate. This is an important point right now, because it's almost time for me to talk about China. I can tie all this together by letting everyone in on a secret of research professionals.

Rarely is the future so readily apparent from what we know about the present. Our statistics, unfortunately, do not often allow such ready recognition of the call and response of economic behaviour. We barely understand the present so well as to be able to predict any convoluted outcomes of the future with any reliability. I am always mindful of how the 1974/75 U.S. recession had been underway for many months and was approaching its trough before the forecasters recognized it. As George Wino, the retired Chief Economist for the American Textile Manufacturers Institute, once told me, forecasting is a job of catching straws in the wind.

What we know about China and its commodity economy in particular calls into question such fundamental assumptions about markets and rational economic behavior that the bizarre is as commonplace as what we consider normal. This gives rise to numerous contradictory reports from day to day from that country. One day the country is said to have 1.5 billion shirts in stock and a bumper cotton crop in prospect. The next day China shows up on the U.S. export sales report as a big buyer of U.S. cotton.

I read a lot of translations of Chinese reports and academic articles to form my own impressions of China's commodity economy, and I try to use what I read to assess new information out of China. Like the U.S. specialists who can't agree and who are often unaware of their disagreements, so go the Chinese specialists. I find that understanding China often brings me back to concepts from 17th century western economics.

In fact, this is true not only of China but across Asia, more or less, depending on the country. Understanding this is key to understanding how the Asian crisis happened. And why the forecasters failed utterly at seeing it coming.

The Underpinnings of Efficient Markets and Why Asia Crashed

I'll come back to China and the co-existence of the bizarre and normal, but the discussion of 17th century economics draws me into the question of why Asia crashed. This will lead back to understanding China, if it can be done.

Western analysts often forget about the underpinnings of a successful market economy, many of which are lacking more or less in the countries of Asia. From China to Indonesia to Korea to Japan there are vastly different cultures with profoundly different business environments. Sometimes their domestic business gets done through cronyism, corruption, collusion, or by combination with government. When that happens the principles of western business fade away. We should not expect the result to be the same. Lack of transparency under these conditions and the impending maturity of too much short term debt led to capital flight.

We often forget about the underpinnings of a successful market economy. Much of this material was developed so long ago that we take it for granted when we analyze markets. This is a mistake, and it has been a very big one for the financial community in its analysis of many Asian projects over the past years.

There are a few principles we should always be mindful of in evaluating the relative efficiency of markets.

These are the principles of the need for effective legal systems for the enforcement of contracts, the separation of government and business, the requirement of responsibility of loss and effective methods for bankruptcy, and the need for competition. If you have all of these things, what arises is rational economic behavior as we understand it in western markets.

The prospect of failure in the search for profits leads to cautious management of risk to reward and the conservation of capital, which in turn conserves raw material. By this I mean that capital

is not applied to transform raw material unless there's a reasonable chance of profit over a reasonable period of time. The period that's reasonable depends on how deep the pockets of the entrepreneur and the patience of his banker.

I read a belated article in *The Economist* a few issues back about how Indonesia does not even have a bankruptcy law. The conclusion was that foreign investors who had lost money had little prospect of any legal means of recovery.

One of the best speeches I've read on the Asian crisis was by Alan Greenspan, Chairman of our central banking system. It was a few months ago and he talked about the need for an effective legal system in order for efficient markets to develop and exist. Truly this has been the single most important lesson from the Asian crisis.

The efficiency of an economy depends upon the effectiveness of the legal system, the enforcement of responsibility for loss, and the existence of competition. Inefficiency means waste. Picture the empty Houston office buildings that rose from the unwise lending practices of the 1980's. If a government is funding the losses in a sustained, ongoing manner - in China's case, for example, the government *is* the bank - this can go on for a very long time. For example, I read an article a while back about how a cotton unit of the Supply and Marketing Co-operative in China was still carrying losses on its books sustained in its cotton purchasing activities of the 1950's.

How waste results in a commodity economy is to me a fascinating topic that I will attempt to describe by comparing some aspects of cotton usage in the United States with China. But before I do that let me give some idea of where I am headed with this analysis by pointing to what happened in the commodity economy of the collapsed centrally planned Soviet Union.

For I read an article from the Russian press a while back where a former official of the Soviet Union was reminiscing on the dissolved country's concrete and steel production figures, which they boasted as being the highest in the world. Yet, he observed, were there bridges and skyscrapers across the horizon? The answer was no.

Similarly, the Soviet Union would use 11 or 12 million bales of cotton a year; now the combined Newly Independent States might be using 2.5 million bales at most. Granted, there has been a sharp rise in imported textiles and apparel and perhaps a fall in living standards as the Engle coefficient - the percent of income spent on food - went to 50%. But there was enormous waste in the centrally planned system, and an awful lot of cotton went to make things that nobody wanted.

Centrally planned economies waste raw materials. So do economies guided by cronyism, corruption, collusion, and combination with government.

The flip side of this coin is what we've been hearing in a good deal of the commentary that has followed the Asian crisis: The world has too much manufacturing capacity, and deflation is a plausible outcome. That is a reasonable statement. The proof, fortunately, has yet to arrive.

The Structure of Industry and Raw Material Demand

The efficiency of the profit motive in directing the consumption of raw material like cotton does not stop at the spindle. The commodity balance sheet stops looking at usage once the raw material is initially processed. The assumption is generally that price will ration demand at that point. In fact, what we've learned in cotton the last few years (and in corn, too) is that when you really have to do that because there's simply not enough of the stuff, prices find some very extreme levels.

What happens is that the textile mill here in the United States typically processes cotton at a rate roughly commensurate with the shipping orders that result from his prior sales. In times of slack shipments, he may choose to keep his plant running closer to optimal conditions than shipments would otherwise dictate by building inventory somewhat. When sales and shipping orders build back up subsequently, he'll ship some from that inventory. But the dividing line on an inventory build versus draw is measured in a few spare weeks of production. Over any prolonged period of time measured in a year or more, the ratio of sales to production is 1.

For his customer, the apparel or home furnishings manufacturer, the reverse may be true to some degree. These industries may ship from accumulated inventory. The reason will be because they face huge swings in demand within the year related to the holidays or the seasons. They have to anticipate that to some degree and accumulate inventories from which to ship at the appropriate times.

The pipeline contains an enormous amount of raw, intermediate, and processed material, and the quantity depends upon the efficiency of the organization of industry and the channels of distribution. In the United States, I think it's reasonable to assume that at least a year's worth of cotton consumption is tied up in the pipeline in the form of yarn, fabric, and finished goods at any given point in time. What's interesting is how it breaks down. We have weaving mills, spinning mills, and a few vertically integrated apparel firms consuming raw cotton.

The weaving mills, consuming about 60 percent of the industry total, run their own spinning sheds due to the high cost of capital to enter the weaving industry. They will hold inventory of fabric equal to from three weeks to two months of production to keep the factories running nearest optimal levels even when they're not shipping at those levels.

The spinning mills, on the other hand, are producing yarn for sale, about eighty percent of which goes to the knitting industry. That industry has a low cost of capital for entry, and it makes more sense to buy the yarn than to get into the business of producing it. For the sales yarn mill, the product is bulky relative to the invested value. The warehouse is the loading dock, and if inventory exceeds a week or two of production, the problem is severe.

And so it goes down the pipeline. There are converters, apparel manufacturers, wholesalers, retailers, all of whom hold inventory, more or less commensurate with their own particular economics of producing, warehousing, or shipping. Based upon the statistics available on the industry and the distribution system, there's probably a year's worth of cotton usage at the spindle tied up in the pipeline at any given point in time.

The wonder of this is that each of these units is responding to the principle of the conservation of capital. It will not apply capital to raw or intermediate material unless there is some reasonable prospect of a reasonable reward. Otherwise, within some period of time, there is the prospect of bankruptcy.

Normal inventory levels vary for the business units operating in the pipeline. For the sales yarn mill, it's a week or so of production. For the weaving mill, it's about a month. For an apparel manufacturer, about 6 weeks. For a retailer, about 10 weeks. At each point the profit motive controls the accumulation and decumulation of inventory, conserving the raw material being fed into spindle at the beginning of the system.

The quantity expands and contracts with business conditions, and it explains how an industry like cotton-processing can have a fifteen percent contraction in output during a recession when consumer demand might contract by 2 percent.

China's Cotton Situation

This brings me back to China. It's a country which has begun the reform of a vast legacy of central planning.

Where capital is not conserved, highly inefficient consuming enterprises can come in to existence, sometimes at the whim of government planners. Whether they are efficient or not can depend not on whether they're making money as we think of it here but on the availability of operating funds from the government. And once these enterprises exist they can be enormously difficult to eliminate. Bankruptcy does not exist for state-run industry.

The following annual statistics were calculated a report of the Ministry of Internal Trade of the Peoples' Republic of China:

Domestic stock of cotton as a percent of domestic sale: 101%
Domestic stock of fabric as a percent of domestic sale: 81%
Domestic stock of apparel as a percent of domestic sale: 42%
Domestic stock of knitted underwear as a percent of domestic sale: 88%

If the U.S. pipeline holds a year of cotton consumption, China's may well hold several years worth. I suspect that's the normal legacy of a centrally planned economy. China's situation now is a hybrid one between the market and government direction.

Recall that I said for the profit-motivated industry of the United States, the ratio of sale to production over time is necessarily 1.

The average sale to production ratio for cotton yarn for most of 1997 in China was 96 percent. By historical standards, this is pretty good; at the point of yarn production, sale is only four percent less than production. For fabric production, the sale to production ratio has been running about 94 percent. For garments, it's about 97 percent.

It's been less than 1 for year after year after year. Stockpiles accumulate. What the Chinese call "triple debt", where no one can pay each other ensues. The government injects funds to clear debt chains and production resumes. This has been the recurring pattern for the last ten years.

Each point in industry represents a separate account and therefore an opportunity for inefficiency to exist. There are about 25,000 cotton mills in China. In the United States, there are about 500, and each is a prospective profit center if its future is to be assured.

The Chinese have come to understand this and have chosen to make the reform of the textile industry a top priority for 1998. Fifty-three percent of textile enterprises are losing money. The state-owned industry has been losing money for the last five years in a row. Forty percent of state-run enterprises are said to be on the verge of bankruptcy, whatever that means for a business owned by government.

It has been said that given enough operating funds, China could easily consume 5 million tons of cotton every year.

A research associate from the Chinese Academy of Social Sciences wrote a couple of years ago,

"Today, China's textile industry has around 42 million spindles, and it needs more than 100 million dan [5 million tons] each year. Although cotton production exceeded 90 million dan [4.5 million tons] in 1995, we still fall short by about 10 million dan [500 thousand tons]; cotton supply is still tight." ["An Analysis of China's Cotton Production and Policy Suggestions Based on the Supply-Demand Situation", Interview with Xu Fengxian, Research Associate, CASS Economics Institute, *Nongmin Ribao*, April 10, 1996, FBIS, July 3, 1996]

This concept of demand as a function of production capacity is a foreign one here, but in the Chinese system where lines between government and business are blurred, it is often a reality.

Once you understand the fundamental differences between the two systems, many of the strange and bizarre tales that emanate from China so often begin to make sense. I can paraphrase the following analysis of the Chinese textile industry, also from a translation of the Chinese press:

Statistics show that in 1992, China had 42 million spindles, 3.4 times as many as in 1980, for an average increase of 7.4 percent per year. during the same period, cotton textile consumption grew by only 3.3 percent per year. Production capacity grew by 1.3 times faster than demand.

The way that some Chinese academics look at this is to say that textiles became over-stocked, while raw cotton demand was ever-growing. Meanwhile, many enterprises operated way below capacity, which they consider poor efficiency.

As I said earlier, the Chinese government understands the problem. It has initiated this year as a major priority the reform of the textile industry and is said to be conducting a program in spindle reduction. Recall that they have 42 million spindles. It is the objective of the government to scrap 10 million spindles over the next three years, beginning with 4.8 million spindles in the coastal provinces in 1998.

It is impossible to know how many of the spindles have been active, nor how often, but to me the result of this is clear: There will be less capacity, and they will use less cotton.

This will not necessarily cause a surplus, because the Chinese cotton problem has as much to do with the purchase and distribution of raw cotton as it does with "excess demand", in the Chinese sense of that phrase.

The fundamental problem is simply that the purpose of business has not been about one thing and one thing only: to make money. This contradiction between the essential purposes of a government and of a business is at the heart of many Chinese problems, where government and business is so often commingled. These problems exist, too, in the handling of their crops, where government entities and business entities are often just two accounts held by the same unit.

As China moves forward with reform, there will be a tendency for the major problems in distribution of cotton to be resolved. And instead of swinging from conditions of chronic cotton shortage to chronic cotton surplus, somewhat less cotton will be demanded to satisfy the country's more stable needs than would otherwise be required. A move toward the market is a move toward efficiency.

Conclusion

A year or so ago a colleague of mine and I were talking on the phone and the conversation turned to some topical material for an upcoming speech he was scheduled to give in one of today's troubled Asian nations. Like most prospective speakers, he was open to ideas and material that would interest his audience.

I offered up some of my favorite material, which has to do with the underpinnings of efficient economic systems - principles that I talked about today with respect to the current Asian cotton situation. Actual business models around the world vary so much from what we assume here in the west that we are surprised and perplexed when events do not conform with what we expect.

It's also because our knowledge of the present is often so poor that we become so easily confused.

Confusing, too, is how we tend to look at demand in a commodity economy in terms of an apparent consumption identity- production plus imports less export- when in reality there is a lot of waste in distribution, especially when consumption is not directed by the profit motive. This is one of the big mistakes the Malthusians make, especially the ones who don't realize how the research professionals use a lot of such identities to interpolate what the numbers are.

There is a beat and a drum that goes with the phrase "market-oriented". I truly do believe that nothing is more efficient at directing resources than the profit motive. Sure, if you could predict the future, maybe government direction or the commingling of government and business as in some of the Asian models could work better. But you can't. We barely understand the present, and can only recognize the turning points. Too many events, both big and small, can change things.

To continue on a market oriented path, whether in today's troubled Asian economies or in China, one thing is sure: commodity economies will become more efficient, and that means where there were shortages there will more frequently be abundance.

The new Asian cotton situation, at least for awhile, is one where they need less cotton.

FINANCING SMALLER FARMS

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Preserving the small or "family farm" has been a long standing concern of policymakers. Agricultural production experienced rapid concentration during the later half of the twentieth century and there is little reason to expect this trend to slow or reverse anytime soon. Vertical integration and horizontal consolidation will continue as farms adopt new technologies and thus enable farm operators to exploit economies of size, scale, and scope.

In this environment, family-sized farm operations face greater competition for productive resources from larger and often integrated *industrialized* farms, particularly in some commodity groups.¹ Yet, family farms, which are defined as those farms where most of the day-to-day labor and management are provided by the farm family, continue to be a mainstay of the farm economy. Their future and hence the structure of agricultural production will be affected by the ability of these operators to access capital at affordable rates.

There are benefits to an increasing farm size and industrialization of agriculture. If large farms are more efficient, the cost of food to consumers declines and resources within society are reallocated to the most productive use. On the other hand, the concentration and control of farm production creates concerns about possible impacts on rural communities as expressed by the *Small Farm Commission*:

...but they (small farms) will fuel local economies and energize rural communities across America.small farms will contribute to the strengthening of society, providing communities and the Nation with opportunities for self-employment and providing a cultural and traditional way of life as well as nurturing places to raise families. (A Time to Act, Page 10)

The Small Farm Commission further contends that:

...small farms will be stronger and thrive using farming systems that emphasize management, skill, and ingenuity of the individual farmer. (A Time to Act, Page 9)

But even the most skillful managers may be unable to compete unless they have access to sources of affordable capital. In earlier times, operators of smaller farms could more easily lower their capital investment by spending more hours in the field. For modern farms, however, high amounts of capital investment are essential to attaining the scale necessary to maintain economic viability.

¹See box for definition of italicized terms.

A modern commercial farm has an average capital investment of over \$500,000, including owner supplied capital and capital from outside sources such as landlords or lenders.

There is a perception that smaller farms may have greater difficulty accessing outside capital than larger farms. Small business loans often represent greater credit risks because the owners have limited financial resources and business experience. The higher cost of evaluating and monitoring credit risks of small businesses, such as small farms, can raise their cost of borrowed capital relative to larger firms. Here, we examine methods used by smaller family farms to obtain capital. We also discuss structural changes occurring among financial institutions and how these changes could affect the availability of capital to small family farms. First, we start by identifying groups most likely to experience problems obtaining access to outside capital.

Defining Smaller Farmers

The National Commission on Small Farms was appointed by in July of 1997 to examine the status of small farms in the US and to determine the course of action for USDA to recognize, respect, and respond to their needs. The Commission issued their report *A Time to Act* to Secretary Glickman in January 1998. Following the recommendations of the Commission, we define small farms as those farms with less than \$250,000 in annual sales and for which the day-to-day labor and management are provided by the farm family. The Commission recognized that while \$250,000 in sales may be high for some commodities, in other areas, it is barely sufficient to provide a net farm income comparable to that of an average non-farmer. The Commission chose the \$250,000 definition because it believed that *farms up to that size are among those whose survival is most endangered*, A Time to Act (pg. 28).

The Small Farm Commission's definition includes 94 percent of all US farms. This is a broad definition, that encompasses many groups who are likely to have limited needs for capital or for whom accessibility of capital is not likely to be an issue. For example, farm operators who consider themselves retired would have little need for outside capital. Others, such as those with substantial net worths or off-farm incomes, should have less problem accessing outside capital sources. Hence, if one is to understand the nature and magnitude of the role outside capital plays for smaller farms, one needs to take a detailed look at their structural and financial characteristics. Specifically, what groups of small farms are more reliant on outside capital? What groups are more likely to have problems in obtaining outside capital?

Noncommercial Small Farms

Though not an official USDA definition, farms with less than \$50,000 in annual sales are generally considered noncommercial since they do not generate enough sales to be a viable business on their own. These farms produce just 10 percent of the value of nation's food and fiber, but number 1.5 million (75 percent of all farms). Despite their low output, they can not easily be dismissed because they own nearly one-half of all farm assets and owe one-third of all farm debt.

Many noncommercial sized farms have limited needs for outside capital. Included in this group are 250,000 farms operated by farmers who consider themselves *retired* (table 1). Given their stage in life, these farmers have limited credit needs as indicated by less than 13 percent reporting

any outstanding debt. Another 175,000 farms could more easily be classified as *country homes* than farms. These were characterized by high household incomes, higher valued homes, and higher net worths than other noncommercial farms. With average household incomes of \$76,000 and a average farm net worth of \$445,000, they should have little problem accessing outside capital sources. With 90 percent of their debt for real estate purposes and investment in the operator dwelling, these credits are more characteristic of home mortgages than of farm loans.

There are also 370,000 noncommercial sized farms where the primary operator contributes an average of 490 hours a year to the farm and does not consider their occupation to be farming. Many of the operators within this group could be considered *hobby farmers*. They also have high household incomes, averaging over \$50,000, and rely on commercial banks for much of their financing needs.

This leaves over 700,000 noncommercial farms for whom capital accessibility may be more of an issue. About 340,000 were *limited incomes* or *limited resource* farms with reported household incomes less than 125 percent of the poverty level (table 1). This group is likely to have problems accessing credit because of their low income. Since debt should not be considered a substitute for income, policy options designed to assist this group should include non-credit alternatives.

Another 390,000 farms are defined as *part-time* farmers who consider their primary occupation to be farming and contribute 1000 or more hour of labor to the farm. Included in this group would be those for whom *off-farm jobs are not a choice, but a necessity due to the inability to obtain an adequate return from farming* (A Time to Act, pg 18). While over 40 percent owe some debt, most of the debts outstanding are small. Nearly 80 percent of those with nonreal estate debt owed less than \$25,000 and 66 percent of those with real estate debt owed less than \$50,000. Compared to other noncommercial groups, FCS was a more important credit source supplying 28 percent of their credit. With an average age of 55 years and only 15 percent under 40 years of age, few young people within this group appear to be using off-farm jobs as a method to enter full-time farming.

Small Commercial Farms

There are 400,000 farms with annual sales between \$50,000 and \$250,000, which owe over one-third of all farm debt and account for nearly a third of farm production. But, many of these have high net worths and, therefore, are not as concerned about accessing outside capital. Omitting farms with net worths of over \$500,000 leaves 240,000 smaller commercial-sized family farms for which accessibility of outside capital could be an issue. These farms are much greater users of outside capital than small noncommercial farms, with 78 percent reporting some term debt.

Farms with less than \$250,000 of net worth are of particular concern. Many of these farms require substantial outside capital to obtain a scale necessary to achieve a profitable farm business unit with sufficient income to support a family. Many are highly indebted with about half of the farmers under 50 years of age reporting debt-asset ratios greater than 0.50. Still, some of these low equity farms had limited indebtedness and would probably easily qualify for additional credit. Even for the farms with less than \$250,000 of net worth, about one-fourth of the indebted farms had relatively low debt burdens, with debt-to-asset ratios of less than 0.25.

Commercial banks are the primary supplier of debt to all small commercial farms. This is especially true for farmers under 36 of age with less than \$250,000 of net worth. Banks supplied 60 percent of all credit to this group, much of which was guaranteed by FSA (table 2). The Farm Credit System's (FCS) market share was less than 15 percent. The Farm Service Agency (FSA) direct loans are an important source of credit for farmers with less than \$250,000 of equity.

Providing access to capital for young or beginning farmers has received greater attention from policymakers in recent years. Legislation has geared much of FSA credit programs to better serve beginning farmers. But, young farmers with limited equity rely much more heavily on renting land rather than purchasing land using credit. In 1995, commercial-sized farmers under 36 with under \$250,000 of net worth owned only 17 of the acres they farmed (table 2).

Trends Affecting Small Farm Financing

Rural financial markets are changing rapidly. Change is coming from advances in technology, financial innovations, and deregulation. Many past barriers to more efficient credit delivery, such as geographic limitations on banking activities have been removed or are being liberalized. Such changes in the financial industry increase local competition and the integration of rural credit markets with national credit markets. Loan funding or the liquidity of rural credit markets, while a traditional concern, remains sufficient in the 1990s to meet the capital needs of most agricultural producers. But, some groups may be affected by the ongoing changes in financial markets. The increased usage of credit scoring and bank consolidation could have adverse impacts on the supply of credit to small farms.

Credit Scoring and Low Documentation Procedures

Small credits are often charged higher interest rates because of the fixed cost of making and monitoring small loans. Agricultural lenders are turning to credit scoring and low documentation techniques to reduce the cost of credit decisions on smaller credits. Credit scoring, where the financial strength of a borrower is rated by a set procedure, has been used extensively in the delivery of trade credit by captive finance companies. Trade credit providers offer farmers one-stop competitively priced credit with credit decisions made within hours. Such credit is particularly appealing to small farms because it is convenient and is suited for their simpler credit needs. Unlike larger farms, smaller farms are less likely to have complicated credit needs. Also, trade credit providers are sometimes willing to take on less creditworthy customers with the prospect of profiting from sales.

Recent USDA studies have shown that providers of trade credit now supply about one-fourth of all nonreal estate credit to commercial-sized crop farms. Further, these nontraditional lenders are becoming increasingly dominant in the financing of smaller loans at the expense of FCS and commercial banks. These gains are a consequence of the cost advantages captive finance companies have had over banks and the FCS, who have used traditional loan making procedures. In order to become more competitive in these markets, traditional lenders are likely to make greater use of credit scoring and low documentation procedures. For example, the FCS has recently undertaken a trade credit financing program called AgSmart which employs credit scoring techniques. AgSmart is a nationwide point-of-sale credit product which will be marketed

by the FCS to retailers of agricultural inputs. AgSmart will fund operating loans, leases, as well as farm machinery and equipment loans.

Since financial institutions can not profit from product sales, they are likely to implement more strict credit standards. This would have both a positive and negative dimension for financing smaller farms depending on the creditworthiness of the borrower. For the most creditworthy farm businesses, credit scoring is expected to lower the costs of reviewing and monitoring farm loans, making it attractive for more lenders to enter this market. For less creditworthy farm businesses, the standardized rating techniques may increase the probability of loan denial.

Increased use of credit scoring could reduce costs and increase the attractiveness of farm loans of \$50,000 and under. This could result in greater availability and cheaper credit to noncommercial-sized farms and small commercial farms. Many of these farms appear creditworthy and have limited debt needs, making them strong credit scoring candidates. For noncommercial-sized farms, the credit history of the owner may be a more powerful predictor of loan performance than the farm business. The ready availability of this data from credit bureaus and other sources further suggests that lending to part-time farmers may no longer be the domain of community banks. Also, the expanded use of credit scoring will lead to standardization of loans and provide a basis for evaluating pools of similar loans. This ability to securitize a wide range of farm loans may encourage other nonfinancial institutions, such as farm supply cooperatives, to increase their small farm lending.

Low-equity small commercial farms and younger farmers, who are denied credit using credit scoring will continue to rely on traditional financing provided by community banks and FSA. FSA guaranteed loan programs will be important in providing these credits. But, increased use of low documentation procedures by banks and the FCS could deter loan guarantee usage because of the greater documentation requirements. To address this issue, FSA is in the process of examining its documentation requirements for small loans.

Banking Structure

Commercial banks are still the largest suppliers of debt capital to U.S. farms, including small farms. Banks hold nearly 40 percent of all farm debt but supply a greater share of the debt owed by smaller farms. Changes in the structure of the banking industry raises concerns that bank lending to smaller farms may suffer. Mergers and consolidations within the banking industry are yielding larger banking organizations while reducing the number of small banks that are important lenders to small businesses. Since 1986 the number of commercial banks in the US has declined by nearly a third. Further, since 1990 the share of agricultural loans made by banks with under \$100 million in assets has declined while the share made by banks with over \$300 million in assets has increased.

Community banks are believed to have a competitive advantage in lending to small businesses because of their ability to access and monitor the operations of enterprises in their local communities with which they may have multiple business relationships. Relationships are important for accessing credit, but it is less obvious how terms may be affected.

Empirical investigations of the effect of bank consolidation on lending to small businesses have produced a mixed picture. Small business loans constitute a small percentage of total loans for large banks and a large percentage of loans for small banks. This suggests greater concentration may threaten the flow of credit to small farms. However, when small banks merge or small banks merge with mid-size banks, there appears to be little change in small business lending. In markets where mergers have reduced small business lending, other lenders have increased their share of small business lending. Also, farm lending in regions with high concentrations of commercial farms have not been adversely affected by bank consolidation. But, small farmers in nonfarming regions, such as the Northeast, may have to rely more on non-bank lenders as a source of credit.

Leasing and Contracts

Leasing has always been one of the more common methods of "financing" the control of farm real estate. Studies indicate that for all commercial farms, 40 percent of total capital utilized by the farm firm is leased. This percentage rises sharply for less established younger farmer and low-equity farms. While over half of all farm real estate capital is leased, for young operators with less than \$100,000 of equity, this share approaches 90 percent.

In addition to the leasing of farm and ranchland, the leasing of farm machinery and equipment is also an important financing option for small commercial farms. Leasing is often attractive because access to new technologies can be obtained with lower down payments and lower cashflow demand. As such, there is a greater tendency for less established operators to use equipment and farm structure leasing.

While machinery and equipment leasing remains small in volume relative to debt financing, leasing is growing. Leasing is now widely available and often offers a competitive alternative to borrowed capital. The FCS's leasing arm, the Farm Credit System Leasing Corporation, has experienced a steady growth in leasing volume during the 1990s.

A rise in contract production in the 1990s is also affecting the way small farms obtain capital. An estimated 30 percent of crop production is now under some type of contracting arrangement. Pork production is currently following the path that broiler production undertook in previous decades. With contractual business relationships, the creditworthiness of a farmer is affected by the strength of contracts with integrators. Also, the integrator provides much of the operating capital, such as feed or livestock. These relationships have enabled small farms with limited equity and less collateral to enter into certain farm business enterprises. USDA studies have shown, for example, that contract hog producers have significantly less net worth than non-contract producers.

Attracting Equity Capital

Nonfarm equity capital has been discussed as a method of capitalizing certain farm businesses. In some instances, farmers have made use of limited partnerships and limited liability corporations to attract investors. But these types of instruments are more attractive to firms with higher earnings potential. In most cases, the low returns in farming discourages outside equity investments. Granted, a few small commercial farms businesses do provide returns sufficient to attract equity capital. For example, about 15 percent of all smaller commercial-sized farms reported net farm

incomes of \$40,000 or more and profit margins of 20 percent or more. But, these farms could easily qualify for credit. The main advantage of equity investments would be in lowering the risk profile of these farms.

One alternative for providing equity financing for farm businesses would be the creation of specialized Small Business Investment Corporations (SBICs) for lending to agriculture. SBIC's which are licensed and regulated by the Small Business Administration (SBA), are privately owned and managed companies that provide start-up financing to small businesses. Return expectations for SBICs are fairly modest, averaging just over 11% for the 1977-96 period. With nearly 40,000 smaller commercial-sized farms providing returns of at least this in 1995, many would be viable investments. But, SBICs have fairly significant limitations as to their investments. Investments for working capital, such as vehicles and machinery, are restricted. Also, investments are short-term (typically less than 10 years), limiting their use for financing real estate. While there is limited market potential, this concept may be useful in funding value-added processing or marketing ventures of small farms.

In 1995, farms with less than \$250,000 of equity and operated by farmers 35 and under reported an average return on assets of -2.8%. Thus, beginning farmers, especially those with limited equity, are less likely to have returns sufficient to attract outside equity capital. Many of those in this group will rely on gifts or inheritances received from family members or on the benevolence of the rural community. An example of this benevolence are programs linking retiring with beginning farmers. Typically, the beginning farmers receive use of the land and equipment at a reduced rate.

Government Loan Assistance

While funding for farm lending has generally not been a problem, creditworthiness remains a problem for some small farms. To assist these borrowers, FSA provides credit assistance through two mechanisms: direct and guaranteed loans. Direct loans are originated and serviced by FSA, whereas guaranteed loans are originated and serviced by qualified commercial, cooperative, or nonprofit participating lenders.

Previous USDA research indicates that FSA programs serve borrowers with less wealth, higher indebtedness, less capacity for further debt, and lower incomes. The programs appear to be well targeted to small farms, with 85 percent of outstanding direct program debt and 70 percent of guaranteed program debt incurred since 1984 being owed by small farms. During the 1990s legislation directed FSA's programs to better serve beginning farmers, particularly in the direct loan programs. In fiscal 1997, nearly 90 percent of the loans made directly by FSA to farmers for the purchase, improvement or refinance of farm real estate were made to beginning farmers.

With nearly 70 percent of USDA credit assistance now coming through guaranteed lending, these programs represent one of the primary safety nets for farmers. Although, guaranteed lending goes primarily to small farms, there is some evidence to suggest that participating lenders are reluctant to seek guarantees on short-term loan requests because of the additional origination and servicing costs. FSA is examining its program rules regarding smaller loan requests, simpler lending requirements could spur participating lenders to increase lending to small farms. Guaranteed loans are made primarily by commercial banks, which account for about 80 percent of outstanding

guaranteed loan volume. The FCS is a minor participant in FSA programs. But, the FCS is required by law to operate programs for furnishing sound and constructive credit and related services to young, beginning, and small farmers and ranchers. USDA analysis indicates that some FCS institutions take these requirements more seriously than others. USDA analysis also indicates that FCS lenders underserve young, beginning, and small farms relative to their overall market share of farm debt. The Secretary's Small Farm Commission has recommended that FCS's commitment to serving these borrowers be strengthened by requiring that it devote at least 15 percent of its total lending to farmers under 36 years of age.

Summary

Most of the 1.9 million small farms, as defined by the Small Farms Commission, should have little problem accessing outside capital sources. Most of these small farms would be considered noncommercial since they have less than \$50,000 in annual sales. A majority of these noncommercial-sized farms do not carry any debt. Further, many have household incomes which are above the national average. They tend to rely heavily on banks for their farm credit needs. The ongoing consolidation of the banking industry may mean that these farms have fewer conventional sources of credit. But, because of their creditworthiness and limited credit needs, these borrowers should have ample access to credit.

Smaller commercial-sized farms with less than \$250,000 of equity represent the group most likely to face capital constraints. Most of these farms would require substantial outside capital to obtain a scale necessary to provide a sufficient income to support a family. Further these farmers rely quite heavily on banks for their farm credit needs. Since many lack the financial soundness to qualify for loans using credit scoring or low documentation procedures, greater use of these procedures could adversely affect their credit sources. Also, the consolidation of the banking industry could result in fewer sources of credit available to them. Thus, farmers with limited equity may have to rely more heavily on non-bank lenders. FCS institutions could become a much more important source of credit to small farms with limited equity. But, for FCS to accomplish this task they will need to increase their usage of guaranteed loan programs.

To assist small farmers, the Small Farm Commission proposed the enactment of tax incentives, grants, and targeted lending requirements for FCS. Implementation of these initiatives would obviously help the economic viability of small commercial-sized farms with limited equity, but at a cost to taxpayers. One needs to acknowledge that neither subsidized credit programs, grants, nor tax incentives will completely make up for the disadvantages of being under-capitalized. In addition to *utilizing farming systems that emphasize management, skill, and ingenuity of the individual farmer*, the long run economic viability of these farms will require an integrated effort on the part of public and private entities. One possibility would be private sector foundations set up to provide grants to outstanding young beginning farmers. These grants could be combined with existing programs such as the FSA or State loan programs. Institutions which serve agriculture could be encouraged to set-aside a portion of their profits to help fund a foundation which provides grants or awards to outstanding young farmers who otherwise have limited capital.

Table 1. Financial and structural characteristics of non commercial sized farms.

	Limited Resource	Limited Income	Part-time	Retiree	Country Home	Hobby- type	All
	-----percent of total for US-----						
Total farms	6	11	19	12	8	18	74
Farm production	1	2	4	1	1	1	9
Farm assets	1	10	12	8	10	8	48
Farm debt	3	5	7	1	6	7	28
	-----percent-----						
Acres owned/ acres operated	53	83	77	90	87	83	80
Farming-primary occupation	43	59	60	0	25	0	29
Farms with term debt	41	45	43	13	40	49	39
Indebted farms with:							
Mortgage debt < \$50,000	77	56	66	66	45	75	68
Nonreal debt < \$25,000	66	84	78	88	73	73	81
Debt market shares							
FCS	12	15	28	40	9	8	18
Commercial bank	50	56	49	41	85	70	64
	-----dollars per farm-----						
Farm assets	69,666	377,032	270,046	268,806	474,174	168,867	267,273
Farm operator dwelling	29,000	61,000	54,000	68,400	135,000	49,000	66,000
Farm debt	21,948	24,528	20,411	4,696	34,608	19,623	20,022
Farm net worth	47,718	352,504	249,635	264,110	439,566	149,244	247,251
Net farm income	(2,023)	(5,666)	144	6,927	644	(173)	(546)
	-----dollars per household-----						
Household income	5,200	2,100	43,760	41,670	75,700	52,900	40,150
Operator age	53	59	55	69	52	48	55
Operator labor hours	1,300	1,700	1,650	800	1,100	490	1,134

: Farm Costs & Returns Survey, 1995.

Source

Table 2. Financial and structural characteristics of smaller commercial-sized family farm with <\$500,000 net worth.

	Operator age					
	35 and under		36 - 49		Over 49	
	\$250,000 < Net worth	\$250,000 ≤ Net worth	\$250,000 < Net worth	\$250,000 ≤ Net worth	\$250,000 < Net worth	\$250,000 ≤ Net worth
	< \$250,000	≥ \$500,000	< \$250,000	≥ \$500,000	< \$250,000	≥ \$500,000
-----percent of total for US-----						
Total farms	2	1	3	3	2	3
Farm production	2	1	3	4	2	4
Farm assets	1	1	1	3	1	3
Farm debt	2	1	5	6	3	4
-----percent-----						
Aces owned/ acres operated	17	43	30	52	53	66
Farms with term debt	75	75	82	88	65	77
Indebted farms with:						
Mortgage debt < \$100,000	83	39	62	59	64	66
Nonreal estate debt < \$50,000	66	66	58	62	69	78
Debt market shares						
FCS	13	*	12	18	22	28
Commercial bank	60	42	40	47	40	50
FSA direct loans	13	*	25	*	30	8
Farms with FSA guarantees	28	4	6	6	4	4
-----dollars per farm-----						
Farm assets	176,357	437,634	239,915	482,061	212,543	458,275
Farm debt	66,933	100,321	106,776	128,113	73,163	86,642
Farm net worth	109,424	337,313	133,139	353,948	139,380	371,633
Net farm income	17,613	30,552	9,863	11,296	15,034	13,170
-----dollars per household-----						
Household income	28,381	36,700	29,640	26,402	36,071	36,875
Operator age	31	31	42	42	61	60
-----years-----						
	31	31	42	42	61	47

RECENT TRENDS AFFECTING FARM AND RURAL BUSINESS FINANCE

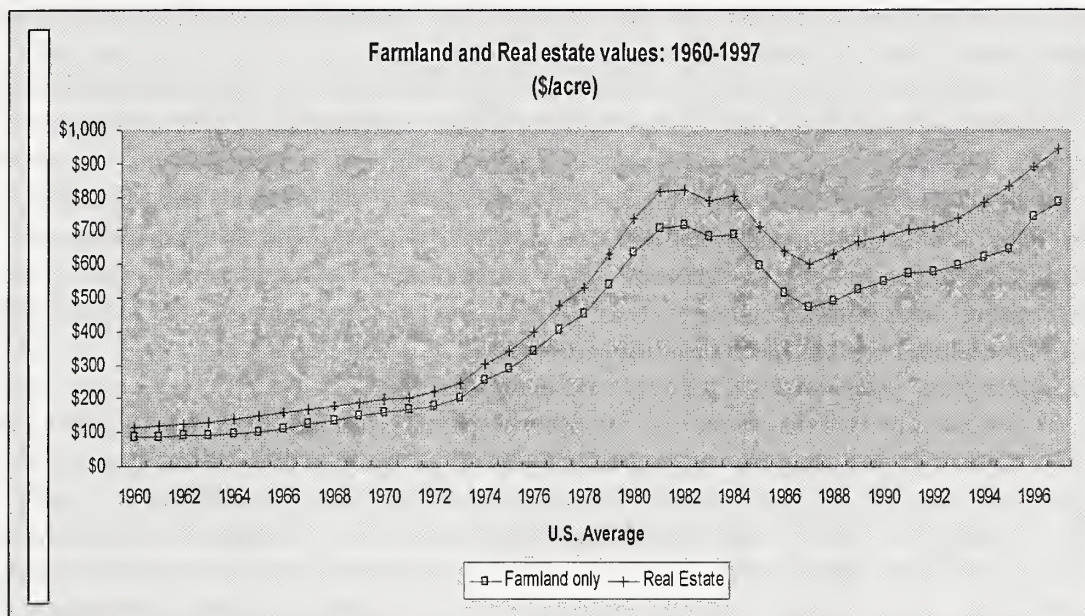
Bruce J. Sherrick
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The availability and cost of capital are important factors affecting the viability and vitality of any sector of the economy. The relationship between the performance of the capital markets and the health of the local economy is especially important in rural markets which have historically lagged metropolitan areas both in time, and in the sophistication of capital products. Additionally, rural financial markets are more dispersed than their urban or metropolitan counterparts, and commonly used measures of concentration generally indicate less competitive rural lending markets, even though the evidence on cost and availability of debt capital is mixed at best. On the regulatory and policy front, there is a renewed emphasis in rural economic development programs, and yet many believe that rural capital markets are insufficient to fully facilitate the broad scale economic transformations they envision. At the same time, liberalized bank branching laws and the continued consolidation of the banking sector raise concerns about potential detrimental impacts on local economies – although again the evidence to date is mixed at best. Federal budget pressures continue to limit the scope of direct involvement in traditional assistance programs in favor of indirect and guarantee programs. In any case, it is generally agreed that the rural financial sector is undergoing dramatic changes, and that the health of the markets it serves depends importantly on its ability to meet the challenges of the future. Thus, my charge today is to identify some of the more important trends affecting rural financial markets and the businesses they serve. Given the *Outlook* theme of the conference, I will try to distill some of the causes and consequences, and occasionally venture cautiously into predictions about how they may play out in the future.

But, before moving to the future, it is worth benchmarking today's situation in general terms. Of course, any generalization will miss cases on both sides of the standard, but according to many measures, the status of the rural economy is reasonably good. Figure 1, which shows the price history of U.S. farmland from 1960 to 1997, summarizes the status of the rural economy over the same period. After the sharp run up in prices through the 1970s, the ensuing decline through most of the 1980s accompanied a generally depressed agricultural economy. Then, late in the 1980s, the recovery began and farmland values and the state of the rural economy in general, rebounded to levels today that by historic trends appear quite good. Farmland is used to illustrate the general trend both because of its importance (representing approximately 75% of ag asset values), and because it mirrored accurately the health of the rural economy.

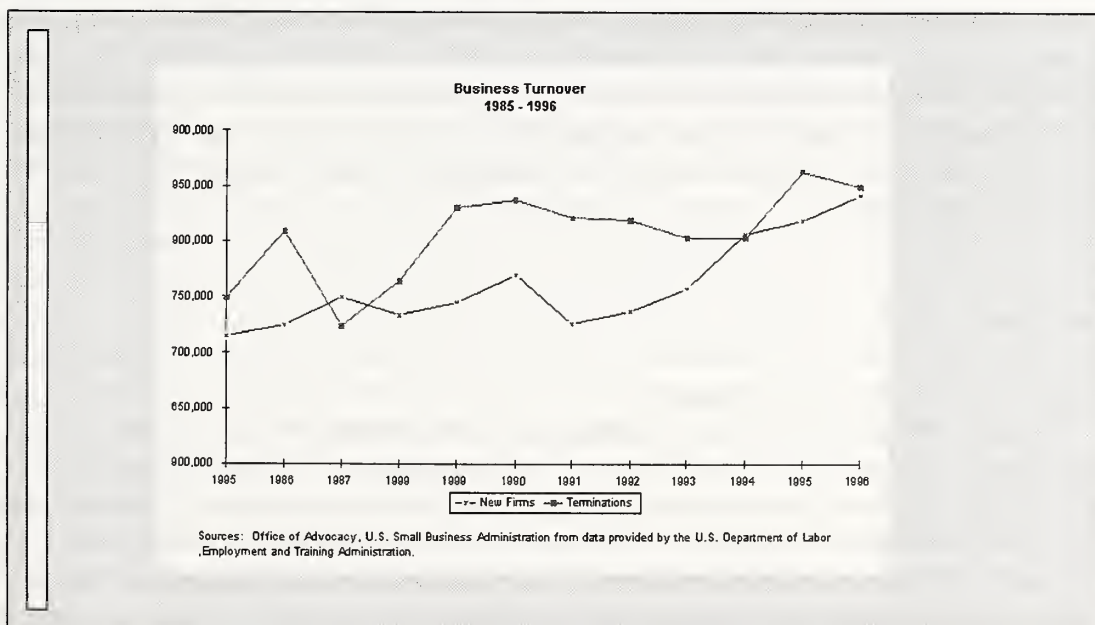
Figure 2, showing small business formations and terminations provides some corroborating evidence although the gap was delayed past the lowpoint for the farmland market. Data for rural areas alone are not readily available, but the small business component of the rural economy was probably not markedly different from that displayed by aggregate data. Trends and IRS business return data indicate that new formations now exceed terminations and that the "recovery" of the small business population appears to be going well.

Fig.1 U.S. Farmland - Price History



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Fig. 2 Business Formations/Terminations



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Thus, in total it appears that since the widespread economic downturn of the mid 1980s, the rural economy has made a nearly complete recovery. Nonetheless, concerns about returning to those historic conditions serves as a caution against abandoning efforts to improve capital markets still further. What, then, are the important deficiencies of these capital markets, and what will be the future capital needs of rural America? Fortunately, much of the work to identify and answer those questions has already been begun. Time constraints prohibit my providing a complete summary, so I will first refer those interested in more information to the proceedings of a conference hosted by the Federal Reserve Bank of Kansas City entitled, *Financing Rural America*. The proceedings contain a collection of relevant studies examining competitiveness of rural markets, prospects for secondary markets, liquidity and funding issues, and other factors that will accompany the resolution of its central question about what can and should be done to maintain and improve rural capital markets. At that conference, it was also noted that the rural economic health, though historically equated with agricultural conditions, now requires a much broader definition and it is this definition that I employ throughout as well.

Regions that were historically dependent on agriculture are beginning to diversify their economic bases, and the attendant capital needs for housing, business development, public infrastructure, and the like may place new demands on rural capital markets (Drabenstott and Meeker). The point I would like to make is that the current financial capital needs of rural America are much broader than the historic set of demands derived primarily from the farming sector alone. Likewise, the set of participants in the future will be broadened from the farmers, community banks, Farm Credit system institutions and rural non-farm business owners that might have historically served as a sufficient subject for this topic.

To organize my comments, I have loosely classified each of the factors and trends that I want to discuss into four general themes. Not all the factors and trends fit neatly into precisely one of the categories and thus, the classifications are interrelated and incomplete. Nonetheless, they serve as an organizing mechanism and hopefully are not too distracting from the points contained within each. The four themes are: 1) technological trends, 2) government, regulatory, and political environments, 3) social, demographic, and institutional factors, and 4) economic, business, and competitive issues including the structure and performance of the banking sector. Within each of these, selected, but not exhaustive lists of important forces are identified, and brief exposition given about their implications for the future. There are intermixed issues of both farm and nonfarm businesses within the rural boundary, as well as factors differentially affecting supply and use of different forms of capital (largely debt and equity). After these are presented, brief conclusions are provided.

Technological:

Remoteness and the "six clicks of separation"...

Though somewhat *cliche*, the much heralded information age holds the promise to radically affect – even redefine to some degree – rural economies. The “six degrees of separation” which has become a euphemism for the interconnectedness of individuals is being replaced by the “six clicks of separation”. Advances in information and communications technologies have begun to redefine proximity in terms of the number of mouse clicks it takes to connect, rather than geographic distance. Drabenstott and Smith refer to “new spatial linkages” that can no longer be proxied by distance. It is this concept of “economic distance” or the

difficulty in arranging transactions that could redefine rural not in terms of its distance to population centers, but in terms of the developments that facilitate transactions and information exchange. Lower cost information technologies also tend to reduce the minimum size of capital transactions since the lower, but still sunk cost of assessing a potential deal, doesn't have to be spread out across as many dollars to dilute its effect to an acceptable level.

Information as a competitive tool, a two way street...

At the same time that consumers find it increasingly simple to shop large numbers of potential vendors via internet searches and the like, providers of financial services are increasingly able to segment markets more finely due to improvements in information systems. Scanner data from grocery stores are routinely used to target consumers with personalized offers at a level of specificity that sometimes startles me by the accurate anticipation of future purchases. Can financial markets be far behind? Already there is a great deal of sharing of information between credit card providers and ancillary service providers based on the nature of the use of credit. And, improved score carding methods are being used that include more and more data fields and less and less requirements for local observable information. Thus, while information technologies reduce the economic frictions in typical financial relationships, they also lower the barriers for participation. The issue for rural financial market participants will be whether they can keep up and integrate the advantages of location with information that is no longer as confined by locale.

Payment and transaction systems...

As consumers become more comfortable with online payment and transaction systems, the location of the facilitating banking institution becomes less important. And, the costs per transaction continue to fall. To some degree, the differentiation between traditional debt providers and other financial service providers gets blurred - particularly in terms of deposits and money accounts that then appear identical on the home office computer screen. Again, as the need for a local visible physical presence diminishes, local borrowers may enjoy improved access to new financial products and services.

Separation and blurring of traditional banking functions

Improved information technologies have also permitted an increasingly finer separation of the traditional banking functions. Origination may now more easily rest with vendors or point of sale locations, funding can take place on national markets, underwriting in a specialized organization, traditional backroom service providers may carry the transactions and so on. Likewise, regulation and oversight function should become easier as the reconnaissance can more easily be done remotely. In my own case as an example, my university paycheck is electronically deposited in a local bank, and a monthly automatic withdraw is made of a fraction that then goes to a money market fund in a local office of a national brokerage house. That account then pays a mortgage servicer at third bank that forwards it to the pooler that purchased my mortgage from a mortgage originator that I happened to locate by an internet search of FDIC reports based on loan to deposit ratios! My reason for searching? I was not satisfied with the very first bank's rates when I refinanced my mortgage that they formerly held. The reasons for this convoluted arrangement are a series of insignificant points in my own history, but I no longer have much concept of where institutional boundaries begin and end and each of these transactions was accompanied by benefits (not costs) for association with my business. More to the point, the

market barriers in rural markets are likely falling as the capacity to enter those markets is improved with information technologies.

Scale Effects

Contrary to the previous point, there are significant scale effects that on their own present disadvantages to local providers in rural markets. This effect is distinct from the issue of whether community banks have sufficient capacity to fund large scale development projects.

My sense of what this means for rural markets is a general improvement in performance, by capital providers but I am actually a bit less optimistic that it will lead to a reduction in the "gap" between rural and nonrural markets. The technological half-life, it seems to me, is still generally underappreciated and I do not expect that rural markets will suddenly begin adopting new technologies at an increasing pace relative to non rural markets.

Government, regulatory, and political:

Rural agenda replacing agricultural agenda

Structural changes in the agricultural sector have been followed by a natural realignment of its political influence. No longer does the "farm bill" dominate the agricultural agenda, and the agricultural agenda itself has been somewhat redefined in terms of rural issues-in-the-large. Food safety issues now occupy an important part of consumers' collective consciousness about agricultural production as do environmental impacts associated with food production. A result of this political realignment there is feeling by many rural producers that their "efficiency" at producing low cost and plentiful food now requires that additional attention be devoted to safety, environmental sensitivity, and attributes that are now part of the regulatory environment rather than assumed features of their own ethic.

Declining direct involvement toward sponsored involvement...

Government budget pressures, while ever present, have recently been credited with favoring indirect over traditional direct government support programs in housing, agriculture, rural development, and so on. The bad news is that it is increasingly unlikely that a future rural decline would be accompanied by large scale infusions of capital from the federal government. The good news is that sponsored enterprises (including secondary markets in housing, and some targeted loan guarantee programs) have provided some great success stories. And, community based private market efforts to facilitate economic development likewise are beginning to flourish.

Liberalized bank branching and authorities....

There is a mixed message to rural economies from the results of liberalized bank branching and the continuing consolidation of banks, as well as from the continued relaxation of Glass-Steagall restrictions. Traditionally, local business (farm and nonfarm) have relied on local and community sources of debt capital. As more and more community banks are purchased by regional or national parents, or consolidated into more aggregated holding companies, questions arise about the impact on local availability and pricing of credit. The empirical evidence is mixed at this point, but on balance suggests a slight destabilization of local availability and a reduction in business and agricultural lending (see Gilbert for summaries). Prospective studies likewise anticipate reduced lending to small businesses as banks are merged into larger organizations and

become less dependent on local borrowers (Keeton, Berger, et al.). At the same time, affiliation with larger entities leads to improved funding and liquidity opportunities.

Agency market access for funding, liquidity – and distribution of authorities...

Perhaps the most controversial issue that will ultimately be resolved through the political process is through what mechanism, if any, will access to agency market funding be made available to rural markets and for what purposes. At the most general level, there are those who argue that the government backing on funding channeled through Farm Credit, Fannie Mae, Freddie Mac and so on is no longer needed while others argue that additional conduits to agency markets are needed to ultimately support business loans, rural infrastructure development and improvement projects and so on. The *actual* policy debate, however, is much more specific. Even accepting that the role of a GSE is to fill a gap that exists when private market benefits are less than costs, but for which the public costs are less than the benefits, the question remains as to the mechanisms for doing so. In terms of lending to rural enterprises, there are current competing proposals to expand access to Federal Home Loan Banks by relaxing collateral and membership requirements, or expand the access to Farm Credit system funding by commercial banks. The political chess match has been made three dimensional by Farmer Mac's recent revitalization and arguments for expanded authority to further develop secondary markets in rural America. Regardless of your posture toward any of these most notable players, the empirical evidence of less reliable deposit-based funding is strong (see Barry and Ellinger for a more complete development). The "deposit drain" affecting rural community banks as individuals switch more and more toward money accounts and mutual funds at brokerage firms shows no signs of reversing. Thus, the resolution of this debate will, in all likelihood, fundamentally affect the structure of the financial industry lending to rural America. Still, the proposed policies focused on access to agency market funding have been difficult to resolve as much due to their competitive non-neutrality as due to questions about their economic desirability.

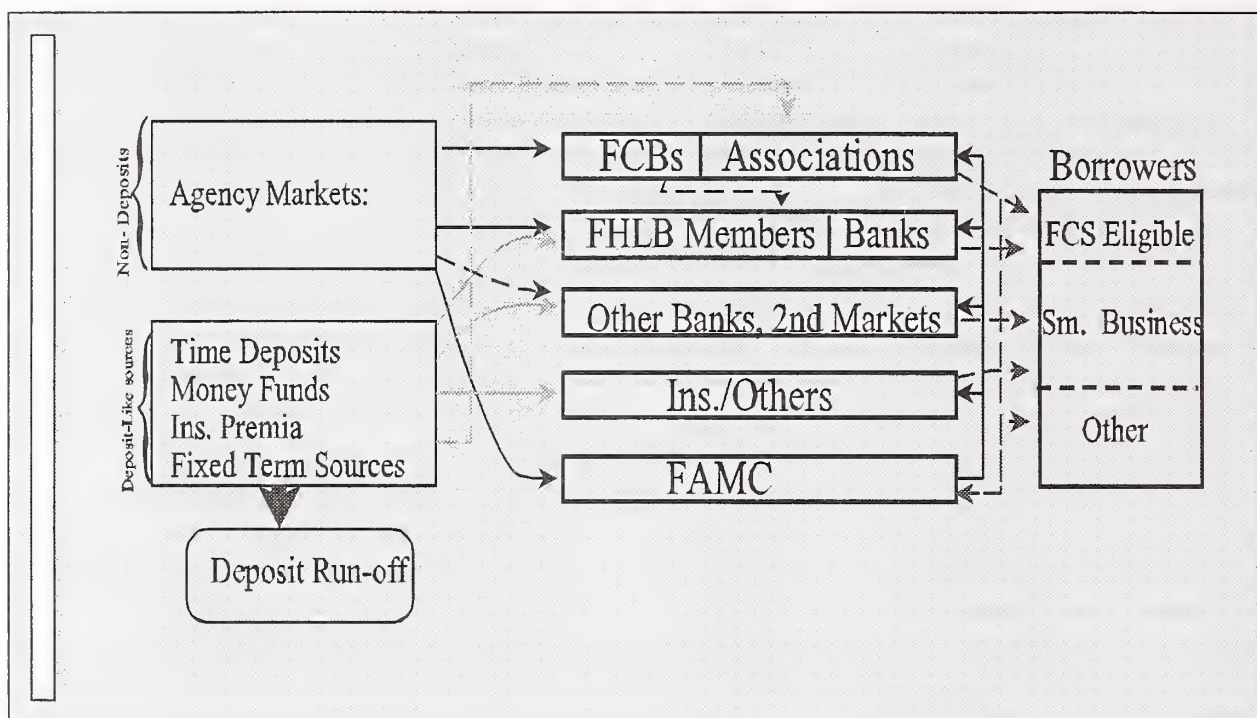
Figure 3 schematically represents some of the linkages from agency funding sources to borrowers in the agricultural sector with existing channels (lines) and proposed channels (dashed and light). Given the number and complexity of paths, it suggests that simplicity is not likely the policy imperative and that multiple channels are apparently acceptable and perhaps even desirable. Further, the inertia of the political process implies that it is unlikely that complete elimination of agency access is even remotely feasible. The real policy issue is to define how, not if, rural America will source money needed to capitalize its growth and evolution.

Social, demographic, and institutional:

Aging asset ownership of rural assets...

Although empirical support is sparse, concerns exist about the aging rural population in terms of asset ownership. Significant questions exist about the ability to facilitate the transition in ownership of closely held enterprises (especially farms and rural family businesses) and about willingness of a new generation of owners to commit to local communities. Although this is primarily an issue of size and form of business organization rather than location *per se*, the most vulnerable population is probably more concentrated in rural areas.

Fig. 3 Agency Market Access & Channels



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Environmental awareness - responsibility shifts...

The rural community is being increasingly held responsible for society's perceptions of the status of the environment -- and not just by farmers. Historically, the government was perhaps more heavily relied upon to regulate and insure that suitable protection standards were enforced. In the future, I suspect that one of the "products" of rural America will be an "environmental condition" that is acceptable to consumers of the remainder of rural America's products. Thus, more frequently in the future, financing may be tied to a set of desired environmental attributes as a condition of the loan.

Regionalization of markets...

The livestock and dairy industries have witnessed massive shifts in the location of production units that have accompanied consolidation over the past decade. Manufacturing businesses likewise have regionalized to some degree. A seductive prospect for further rural development is sometimes posed in the possibility of attracting more manufacturing to non-metro locations although there is little empirical support for this prospect (Barkley). More likely are service industries, recreational facilities and "way of life" attractions -- manufacturing requires plentiful and inexpensive labor -- both rare attributes in parts of rural America.

Quality of life issues - labor, housing, health care, education...

A plethora of "quality of life" issues affect the future prospects for rural economic progress. The wish list, of course, involves a pristine accessible natural amenity with affordable high quality housing, quality health care, high quality education, low population externalities, and the like. Few locations possess each of these attributes – at least for very long! Still the point remains that development of nontraditional resources may hold the greatest promise for economic development in some rural communities rather than focusing on traditional agricultural, small businesses and light industrial firms to cause economic development.

Economic, business and competitive issues:

Consolidation of banking and production sectors...

In addition to the effects of a consolidated financial services industry, (see section on government, regulatory and political environment), the agricultural production sector continues to consolidate and move to production under contracted arrangements. Local community banks often find it difficult to lend to highly integrated operations due in part to the scale of the operations and also because the nature of these operations makes underwriting more complicated and involved. In many cases, additional equity is also needed in the "deal" and traditional financiers have served mixed roles in locating the complementing capital. As this trend continues, the local producers will increasingly rely on non-local sourcing of funds.

Measures of rural financial market competitiveness and accessibility have shown that rural banks are smaller, more dispersed, and by many measures, exist in less competitive markets. However, table 1 provides some additional information that confounds the interpretation of competition a bit. As shown in the final column, bank locations per unit population unit are actually higher where populations are thinner. If one further considers the number of "partial" outlets represented by ATMs and kiosk banks in places like grocery stores, issues of location and service distance are even less clear.

Table 1. Bank Competition

County Types and Measures of Competition - 1995

County Type	Counties	Ave# head offices	Ave #. branches	Ave.Bank Size (\$M)	Branches per 10,000 pop.
Farming(all)	291	1.6	3.5	37.1	7.58
Mining (all)	33	0.9	3.6	62.2	3.70
Mfg. (all)	49	1.4	4.7	58.8	4.27
Other (all)	158	1.5	4.4	58.7	4.29
<hr/>					
Farming(some)	265	2.7	6.5	51.7	5.04
Mining (some)	114	2.0	7.5	95.9	3.28
Mfg. (some)	467	2.5	12.6	122.8	3.71
Other (some)	927	2.8	11.2	93.9	3.74
<hr/>					
Small Metro	205	4.4	31.2	120.4	3.01
Other Metro	632	6.0	76.8	594.1	2.58

Source: Barry and Ellinger

Agency market access and deposit drain...

The issue of agency market access (described briefly above) will in important ways determine competitive and cooperative relationships that hold the potential to significantly affect the structure of the market. In any case, a move away from deposit-based funding of loans in rural America toward more securitized or agency funded sources is virtually insured. The result of more standardized and more securitizable loan products is largely a positive for borrowers – unless it arises solely as a result of the elimination of customized loan products. There will always be a role for the local lender to fill and increasingly, there are roles for non-local sourcing in developing rural enterprises as well.

Equity market developments...

For numerous reasons, equity markets have been slow to develop in agricultural assets in particular, as well as for small business needs. At the same time, aggregate equity positions in agricultural assets are extremely high in comparison to other sectors of the economy. As new, more integrated, coordinated, and larger scale production units continue to form, there will be increasing pressure to develop functioning equity markets supporting agricultural and other rural businesses. My crystal ball doesn't project an image for much revolutionary change on this front however. Instead, I suspect that equity infusions will require complicated individualized efforts to arrange for some time into the future.

Non-bank banks....

An interesting development that may turn out to be an iceberg's tip is occurring with nontraditional capital suppliers. Increasingly and at an increasing growth rate as well, nontraditional debt providers are taking market share away from traditional lenders (Dodson). The most obvious examples involve firms like John Deere and J.I. Case which each run vendor finance operations and have developed huge lending operations originally to support their merchandising operations. Interestingly, Deere has begun funding the vendor finance operations of other agribusinesses and at least one cooperative as well. Apparently they have found a profitable niche and have begun filling it to the advantage of their eventual customers who are largely the same customers of traditional lenders. Less obvious are firms like Ag Services of America who, in effect, substitute their wholesale borrowing capacity for their customers' collective debt and re-lend on terms that facilitate their other businesses. Feed companies are likewise showing up in more and more financing deals either providing credit enhancements or direct quasi-equity stakes. One need only consider the growth of G.E. Capital, or major leasing and acceptance corporations to at least spur interest in the potential effects in rural America if non-bank banking finds niches in otherwise underserved markets. In this regard, what is generally viewed as more numerous market imperfections and inadequacies at least includes the potential to attract entrepreneurial solutions.

Concluding Comments:

Even though the current rural economy is enjoying relatively stable and prosperous times, there remains appropriate concern to avoid actions that could regenerate the economic turmoil of the 1980s. And, there is concern that while improving, the rural economy is losing ground relative to its non-rural counterpart (Duncan). The future path of many rural communities includes a more

diversified economic base and more concentrated business structures – both of which require new and perhaps different forms of capital. At the same time, financial markets are consolidating and becoming less “local” or “community based”. On top of all of this, the government has adopted a posture of less direct involvement and has sent mixed signals about the future role and mechanisms for access to agency market funding for existing lenders. Accordingly, there are questions about the intersection of these trends. If capital providers are: (a) becoming less competitive at the same time that (b) governments are less active in developing new supporting institutions and (c) the needs of the customers are increasing and more specialized, then fairly bleak inferences could be drawn for the future of rural capital supply and use. On the other hand, if: (a) the evolution of the production sector is driven by efficiency and economic prospects, and (b) bank consolidations result in improved cost structures, and (c) the need for direct government involvement is declining, while (d) technologies are providing for broader, more uniform, and competitive access to a largely potential set of suppliers, then a contrastingly positive inference can be drawn. There has been a great deal of empirical work investigating the causes and effects of each of these trends individually. Likewise, there have been highly qualified individuals assembled in conferences charged with addressing these same issues. On balance, the evidence suggests we are more nearly on the latter path although the prospects for broadening the economic base toward more industrialized manufacturing may be somewhat unrealistic for much of rural America. Fortunately, there does not appear, nor does the horizon seem to signal, a credit crunch in rural America. The local lenders face numerous constraints, and will continue to have liquidity and funding problems for managing asset-liability match, but the competing sources appear capable of filling in whenever gaps arise.

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FINANCIAL PROSPECTS, BUSINESS ORGANIZATION, AND MANAGEMENT: FARM BUSINESS CHALLENGES

Jim Ryan, Dave Peacock, and Janet Perry

When we reviewed the farm financial situation at last year's Outlook Forum, we described a U.S. farm economy facing an encouraging future of greater access to an expanding global marketplace, facilitated by a new era of federal farm policy under the 1996 Federal Agriculture Improvement and Reform Act (the 1996 Farm Act). We described an evolving domestic and global agricultural policy era that would allow U.S. farmers additional freedom in making production decisions, and a global market that would present fewer trade barriers and enhanced opportunities to market that product. While increasing farmers' exposure to the risk inherent with greater market orientation, the approach has been advantageous for U.S. farmers over the past two years, as a robust domestic economy and strong export demand for our farm products has produced favorable farm prices and incomes.

Entering 1998, farmers are becoming increasingly aware of the added risk that accompanies greater market freedom. While events of the last few months have not dampened our expectation for a profitable, competitive U.S. farm economy, they have served notice that the road to farm sector prosperity will not be a straight line path of unbroken successes. Uncertainty in Asian financial markets and the slowing of economic growth in some of our trading partners have reduced demand for our farm products, while an excellent 1998 growing season in Argentina and Brazil has added to anticipated global supplies, and a strengthening dollar has made our goods more expensive relative to those from competing producers.

The purpose of this presentation is to report on the financial performance of the farm economy in the recent past, and to discuss its likely future performance, in light of the structural changes, organizational and financial, that are most likely to influence both the level and the distribution of farm sector income in the coming years.

Farm Income Outlook for 1998

A market-oriented farm policy presents added risks not only to farmers producing agricultural commodities, but also to those who would forecast the income of those farmers. We recently reported, both in the December 1997 issue of Agricultural Income and Finance: Situation and Outlook Report, and in the January 1998 Agricultural Outlook, that 1998 farm income was expected to rise slightly from 1997 levels, and, while not likely to equal the record set in 1996,

farm income prospects for 1997 and 1998 looked quite favorable. The farm income record set in 1996 was the result of good, though not record, production of major field crops and higher than average prices, which remained strong even after harvest. Cash receipts were expected to remain relatively high in 1997 and 1998, though not likely to repeat 1996 levels. Expectations for 1998 are periodically revised, and export and price data available since late fall suggest that cash receipts will be lower than previously estimated. Sales for several commodities, particularly hogs, soybeans, poultry, and wheat, will likely be below previous forecasts.

Net cash income, the return to farm operators from sales and other cash income minus out-of-pocket expenses, is expected to be about \$52 billion in 1998, down from \$55 billion in 1997 (figure 1). While substantially less than the nearly \$60 billion 1996 record, 1998 net cash income will be near the average for 1990-95 (\$53 billion). Net cash income, historically less variable than other farm sector income measures, is the best choice of indicators to gauge the funds available for family living expenses and retirement of debt. Including changes in farm inventories and non-cash income and expenses provides a projected *net farm income* of about \$46.6 billion in 1997 and \$43 billion in 1998. This figure is also slightly above the average for first half of the 1990's (\$43 billion), but substantially lower than the record \$52 billion for 1996.

The 1997 projection for *crop and livestock receipts*, based on production and price observations during the calendar year, is for a modest \$1.5 billion decline from 1996's record of \$202 billion (figure 2). Cash receipts for 1998, given present crop and livestock production and price expectations, are anticipated to decline \$2.3 billion from 1997's projection. Lower expected cash receipts for 1998 largely reflect the expectation of smaller returns for wheat, soybeans, and hogs. Cattle receipts are expected to increase by over \$1 billion in 1998.

Even with a slightly larger crop forecast, *corn receipts* for 1997 and 1998 are expected to be significantly lower than 1996 (figure 3). Corn receipts in 1997 fell by around \$3 billion, as 1997 corn prices, despite reaching their second highest level of the 1990's, averaged nearly \$1 per bushel below 1996 levels. Smaller exports also contributed to the lower corn receipts in 1997. Current expectations for a slightly larger 1998 corn crop, and prices similar to 1997, would yield corn receipts close to 1997's projection. *Wheat receipts* fell about \$1 billion in 1997 from 1996's almost \$10 billion. Production of wheat in 1997 was the highest since 1990, and as a consequence, prices were lower due to abundant supplies. With an average or better crop and increased stocks from 1997's large harvest, wheat prices and receipts are expected to be lower in 1998. Increased *soybean receipts* prevented total crop receipt forecasts from declining further in 1997 and are expected to add stability in 1998. Soybeans earned close to \$2 billion more in 1997 than the record \$16.2 billion in sales obtained in 1996. The 1997 increase follows the upward trend of soybean receipts occurring throughout the 1990's. With the largest acreage ever planted to soybeans (70 million) there will be record 1997 production to sell. Yet even with the larger crop, prices have remained fairly strong after the harvest. A vigorous export market contributed to the increase in soybean receipts for 1997, which is projected to be the third best export year on record. A return to average output and slower international trade in 1998 could lead to a decline of \$1 billion in soybean receipts.

Livestock receipts in 1998 will be about \$1 billion below the \$93 billion attained in 1996 and 1997, due mainly to a \$2 billion decline in hog receipts (figure 4). Hog production is expected to

continue rising through 1998. Even with lower expected prices, hog receipts in 1997 remained roughly \$12 billion, the level achieved in 1996. Smaller anticipated pork exports to Asian markets are a factor in lower projected pork prices. After a steady decline during 1994-96, cattle and calf receipts increased by \$2.5 billion in 1997, and are expected to rise another \$1 billion in 1998. Poultry receipts in 1998 are expected to remain near the 1997 level of \$21 billion, as slight increases in broilers offsets declines in turkeys and eggs.

Already a relatively small portion of cash sources of income (3.3% in 1996), *direct government payments* are expected to begin declining in 1998. In 1997, payments represented a mixture of funds from former commodity programs and disbursements based on production flexibility contracts as provided for in the 1996 Farm Act, including advance payment for 1998. Payments received in 1998 are governed by the new legislation, and total government payments will begin to follow the declining levels allocated for production flexibility contract payments through the year 2002.

Total farm production expenses increased about 2.7 percent (\$4.8 billion) in 1997, the smallest rise since total expenses decreased slightly in 1992 (figure 5). From 1993 through 1996, total production expenses rose \$6.7-\$7.6 billion (4-5 percent) each year. In 1998, in response to slightly lower planted acreage and a fall in the number of cattle on feed, total outlays are forecast down around \$600 million dollars, a decrease of around 0.3 percent. This would be the first decrease in total farm production expenses since 1992. The robust domestic economy, with its anticipated low inflation, stable interest rates, and favorable oil prices, will help contain farm production costs.

Farm Assets, Debt, and Equity Continue Upward Through 1998

The value of U.S. farm business assets is expected to exceed \$1 trillion in 1997 and continue growing through 1998 (figure 6). The value of farm real estate, the largest share of the sector's assets, increased 5.9 percent during 1997. Reflecting the favorable long-term prospects for the sector, farm real estate values are expected to grow by 5 percent in 1998. Farm business debt is expected to grow a little over 3 percent in both 1997 and 1998. The combination of strong growth in the value of farm assets and a modest expansion in farm debt indicates a rising net worth (equity) for the farm sector in 1997 and 1998.

Farm business debt is projected to reach \$162 billion by the end of 1997, and to rise another 3 percent in 1998. Rising debt levels do not signal pending financial distress in the farm sector. Despite the increase in debt, farm business balance sheets have shown steady improvement throughout the 1990's. Debt-to-asset ratios have improved, as the 16-percent increase in farm business debt from 1992 through 1997 has been more than offset by the 25-percent rise in the value of farm business assets.

The expected rise in *farm business equity* in 1998 reflects the increase in farm asset values relative to the rise in farm debt. In today's dollars, \$1.083 trillion in assets minus \$167.6 billion in farm debt yields a sector net worth of nearly \$964 billion. Farm sector equity by the end of 1998 is

expected to be almost \$90 billion more than in 1996, and over \$300 billion greater than in 1985. Indicators used to measure the solvency of the farm sector remain favorable for 1997 and 1998. The *debt-to-asset ratio* indicates the relative dependence of farm businesses on debt and their ability to use additional credit without impairing their risk-bearing ability. The lower the debt-to-asset ratio, the greater the overall financial solvency of the farm sector. The debt-to-asset ratio is forecast to be 14.8 percent in 1998, down slightly from 15.0 percent in 1997. Over the last decade, this ratio has been declining steadily from 23 percent in 1985 to 15.6 percent in 1995.

Current income rates of return on farm assets and equity, indicators of the profitability of farm sector investments, remained near 1996 levels in 1997. Total *returns on farm business assets*, including capital gains, declined from 6.5 percent in 1996 to 5.7 percent in 1997, derived from 3.7-percent growth in current income and 2-percent growth in capital gains. Total returns on farm business assets are forecast at 5.2 percent in 1998, reflecting both the lower expected returns to farm assets from current income and somewhat slower appreciation in farm asset values.

Impacts Vary by Type of Farm

For most farms in most areas, 1996 was an exceptional income year. The projected 9-percent decline in sector-wide net cash income in 1997, followed by an additional 3-percent decrease in 1998, will not be evenly distributed across all U.S. farm operations. Changes in cash receipts drive changes in net income for farm operations producing those commodities. Only cattle producers, coming off the lows of 1994-95, are expected to see measurable increases in their net cash incomes in 1998 from 1996. Producers of tobacco, and speciality crops such as fruit, vegetable, greenhouse, nursery, and other livestock may have modest increases while producers specializing in wheat, corn, cotton, hogs, and dairy are expected to experience drops in net cash income from farming from 1996 to 1998. Farm operations specializing in production of these commodities will likely begin to feel additional financial stress in 1998, especially if they entered the year with a substantial debt load to service.

The changes in distribution of income among farm types reflect the beginnings of a geographic shift in the distribution of production in response to elimination of direct Government commodity support programs and changing consumer preferences (figure 7). Increased market reliance is expected to shift production of commodities among states based on comparative advantage. Acreage of corn planted in seven Midwestern states (OH, IN, IL, WI, MN, IA, NE) increased in 1997, and accounted for two-thirds of all corn acres planted, while acreage planted in nine Southeastern states (TX, LA, AR, MS, TN, AL, FL, GA, SC) declined nearly 10 percent from 1996, as farmers responded to greater planning freedom by increasing acreages of soybeans and other crops.

Farm Borrowing Increase Does Not Signal Rise of Financial Stress

The recent and projected increases in farm business debt are relatively small compared with annual changes during the 1970s, when outstanding loan balances grew at an average annual rate of over 12 percent (figure 8). Thus, farm operators' expanding use of credit is not expected to place

excessive demands on their ability to service debt. Farmers are expected to use their available credit lines more fully in 1998, as evidenced by the rise in *debt repayment capacity utilization*. (figure 9) For farm operators, income available for debt service can be used to determine the maximum loan payments a farmer could make, which determine the maximum debt that a farmer could service, given current market interest rates and an established repayment period.

Farm debt repayment capacity use (actual debt expressed as a percentage of maximum feasible debt) effectively measures the extent to which farmers are using their available lines of credit. In 1998, farmers are expected to use available credit lines more extensively. Use of debt repayment capacity rose from 45 percent in 1993 to 56 percent in 1995. Despite the 1996 rise in farm business debt, high net cash income levels and lower interest rates resulted in a drop in use of debt repayment capacity to 49 percent. The effects of expected favorable interest rates throughout 1997 and 1998 will not be sufficient to offset the combined effects of rising debt and lower net cash income, which was reflected in the rise of debt repayment capacity utilization to 56 percent in 1997. Farmers are expected to use about 61 percent of the debt that could be supported by their current incomes in 1998. While this indicator will reach its highest value since 1986, it remains substantially below the levels attained during the widespread farm financial stress of the mid 1980's.

Most Farm Households Receive Substantial Off-farm Income

Most farm households rely heavily on off-farm income because their farms are too small to support a modern standard of living. Since the official definition requires an operation to have only \$1,000 worth of agricultural sales to qualify as a farm, a large number of rural households are classified as farm households despite very low or negative farm earnings. Limited sales typically result from only modest resources being devoted to farming or from a low return on farm assets.

USDA's Agriculture and Resource Management Study indicates that, on average, farm operator households received only 16 percent of their 1996 income from farming (figure 10). Their household income from both farm and off-farm sources, however, averaged \$50,361, similar to the \$47,123 average for all U.S. households, while those operating farms with sales of at least \$50,000 received 55 percent of their income from farming, earning an average of \$40,623 from farming activities. These farms' total household income averaged \$74,519, or 58 percent more than the average for all U.S. households. These households, however, accounted for only about 26 percent of all farm households.

Households operating farms with sales less than \$50,000, which made up 74 percent of all farm households, relied on off-farm sources for virtually all of their income. On average, farms with less than \$50,000 in sales lost money farming, but received \$45,418 in off-farm income. Wages and salaries were the largest component of their off-farm income and accounted for 61 percent of their total off-farm income. Because of their off-farm income, the total average household income for this group of farms was near the average for all U.S. households.

Average operator household income projections for 1997 and 1998, in nominal terms, are not significantly different, statistically, from 1996. The forecast decline in earnings from farming would be expected to have the greatest effect on households most dependent on farming for income, which are typically those operating larger farms. Households operating smaller farm businesses will continue to rely heavily on off-farm income, particularly wages and salaries, for their livelihood. Fortunately, the demand for rural workers has been strong since the 1990-91 recession, with the tighter rural labor market resulting in higher real wages.

Baseline Projections

Longer Term Farm Income and Farm Financial Conditions

Farm income prospects for 1997-2007 appear favorable, although not buoyant, at this reading of the key factors influencing sector receipts and expenses (figure 11). Net cash income through the end of the millennium, and into the early 2000s, is projected to hover around \$56-57 billion. At this level net cash income will average higher than the first half of the 1990s (\$53 billion for 1990-95), but fall below the record \$60 billion achieved in 1996. If current expectations prevail, a steady growth in net cash income will begin in the early 2000s, eclipse the 1996 record, and continue until the end of the baseline. The rate of projected growth over the baseline period (1997-2007) is a modest 2 percent per year. With an expected inflation of 3 percent annually, the sector's inflation-adjusted net cash income by the end of period could be lower than achieved in 1997. The implication is that real net cash income in the future, unless key variables change notably, is expected to not look much different than it does today.

The baseline projections of net farm income are an abstraction from the substantial variability typical of this measure, which, through incorporation of inventory adjustments, reflects more fully the impact of annual swings in production and prices. Since annual variations in weather, crop yields, and indirectly market prices cannot be foreseen, projections of net farm income are represented as a slow but steady rise to end of the base line period. Net farm income is projected to be higher than the early 1990s (\$44 billion), but not reaching 1996's record of \$52 billion until well into the baseline period. The rate of increase projected is approximately 2.5 percent, marginally lower than the expected rate of general inflation. In real terms, then, net farm income in 2007 may be little different than it is today.

In 1994, crop sales surpassed livestock sales as the largest source of receipts and is projected to remain so throughout the baseline period. The dollar value of crop receipts is projected to rise at a rate of 2.7 percent per annum. But with 3 percent inflation, the real value of crop output is declining slightly. The lack of growth in the real value of crop receipts reflects declining real prices. The quantity produced of major crops, such as corn, wheat, soybeans, and cotton is expected to increase over the baseline period. The trends projected for these commodities indicate that production will reach or exceed each of these commodity's record output by the end of the baseline period. Consequently, while crop output can be expected to expand, the larger cash receipts (in current dollars) will not likely be reflected in significantly larger real farm income.

Livestock receipts are expected to grow steadily, 2.4 percent annually, for a total of 27 percent over the baseline period. The overall rate of growth in livestock receipts is slightly slower than crops. Cattle and broiler receipts are projected to increase faster than dairy products, eggs, and hogs. The expected results of the cattle cycle during the baseline period is for a short-term decline in commercial beef output offset by higher prices, followed by both output and prices drifting upward toward the end. Commercial beef output is not projected to reach as high, nor are prices expected to fall as low, as occurred in 1996. A steady rise in broiler output underlies the projected rise in broiler receipts. By contrast, the expanded output of hogs expected during the first half of the baseline is foreseen as pressuring prices downward, resulting in lowered receipts to hog producers over much the 1997-2007 period. In real terms, the changes in livestock receipts projected for the baseline will not contribute to increasing real sector income.

Direct government payments are expected to trend downward. Payments in 1998 will be governed by the 1996 Farm Act, and total government payments will begin to follow the declining allocations for production flexibility payments through the year 2002. Almost all government payments are from production flexibility contract payments or Conservation Reserve Program (CRP) payments. The baseline assumes that production flexibility contracts payments continue at their 2002 levels beyond the expiration of the 1996 Farm Act. CRP enrollment is nearly flat after 2000, so CRP payments are relatively constant in those years. Beyond 2000, direct Government payments account for less than 3 percent of gross cash income, the lowest share since 1982. Thus, the farm sector increasingly relies on the marketplace for its income.

Total cash expenses grow moderately, at a projected 2.5 percent over the baseline. Expenditures for farm-produced inputs -- feed, feeder livestock, and seed -- show the least upward movement. Farm origin expenses, which represent about a quarter of cash farm production expenses, increase at an average rate of about 1 percent per year. The generally slow rise in farm product prices is also reflected in the prices of farm-origin inputs. Manufactured input expenses rise more rapidly (3 percent), near the pace of inflation. Interest expenses appear to represent a nearly stable share of cash expenses (about 8 percent) throughout, although interest rates on agricultural real estate loans rise slightly. Labor costs, which account for approximately 12 percent of cash expenditures, are projected to be the most rapidly rising expense item. Even so, labor expenses are projected to rise at about the rate of inflation.

Baseline farm business asset values rise at a slower pace than recent history, mostly reflecting increases in the value of real estate assets. Farmland values have risen at about 6 percent annually since 1993. Farm real estate values are forecast to rise 5 percent for 1998. The projected rate of increase in land values for the baseline is 4 percent, slightly above the inflation rate. Farm debt is projected to grow at an even more modest rate, reducing average debt-to-asset ratios to below 13 percent by 2007. Total farm business debt rose an average 3 percent during 1994-1997 and is projected at 2.4 percent over the baseline. Real estate debt is projected to rise slowly (2 percent per year), reflecting the present conservative attitude of farm operators toward borrowing to expand their basic resource base. Nonreal estate debt, a large share of which is turned over annually financing production expenditures, appears to rise slightly faster than the overall increase

in cash farm expenses. With larger increases in farm asset than farm debt, farm equity rises during the baseline.

Structural Changes, Environmental Considerations

Over time, farmers' expanded freedom in producing to meet the demands of a competitive global marketplace, and their need to mitigate its inherent risks, will underpin structural changes already underway in the U.S. farm economy, as the number of farms continue to decline, the size of remaining operations continue to expand, and smaller operations increasingly rely on non-farm sources of income. Competition will maintain pressure on farm operations to contain costs, and to expand operations to take advantage of size economies that lower per-unit production costs. Environmental considerations may ultimately limit the size of farm production units. As livestock operations become more fully integrated, further expansion may be limited by local concerns over the environmental impacts of large animal populations on both air and water quality.

Cost Containment Remains Key Long-Term Factor

Several years ago, we identified cost containment as a critical factor relating to the long-term financial well-being of the farm sector. The relative strength of the U.S. economy and currency in increasingly competitive global markets will place continuing pressure on domestic prices and operating margins, making cost containment even more critical today and in the future. As operating margins tighten, reductions in per unit costs of output will be necessary to compete in world markets. Even with modest productivity gains, there will be increasing pressure either to expand farm size in order to spread costs over more units of output, or to adopt new technologies and production practices. Those operators unwilling or unable to expand will face even greater pressure to contain costs by farming in the most economically efficient manner. The availability and adoption of technological advances will continue to be an important factor in reducing per unit costs of production.

Data obtained in the 1996 ARMS indicate that cost-size relationships do exist for most types of farms (figure 12). Lower costs per unit of production do appear for larger farm operations, particularly for those specializing in the production of dairy, beef, corn, fruits and nuts, or vegetables. For example, corn farms with sales over \$1,000,000 had operating profit margins of 34 percent, and average unit costs of \$.70 per \$1 of output, while those with sales between \$250,000 and \$500,000 reported margins of 19 percent, and unit costs of \$.87.

Multiple Entities Share in Farm Operations' Ownership, Management, Risk, and Income

Traditionally, the farm sector has been viewed as a one farm, one operator paradigm. That view is becoming increasingly clouded, especially for larger and industrialized farms, where multiple parties share asset ownership, risk, income, and expenses related to the operation of the farm business. Methods used by farmers to acquire operating and other inputs vary by type, size, and

location of farms and by characteristics of farm operators. These methods, ranging from outright purchase to complex leasing and contract arrangements, determine which providers are paid from operating income or other funds, and which providers share in the farm's net income. Sharing in the farm's business and financial risks is a characteristic that distinguishes between those input providers receiving a share of net income, and those whose inputs are treated as production expenses.

A farm operator's claim on a farm's net income is based on the ways the business secures its assets. Farmers use equity capital from a variety of sources. For example, they may use savings to buy land, equipment, or other inputs. Here, farmers would claim all the income earned from the use of the assets. Single-family farms, where the farm operator provides all the farm's assets and retains all the farm's net income, still dominate farm numbers. Single-family farms accounted for almost three-quarters of farms, however, these farms accounted for about one-third of the value of production.

More and more, a farmer's funds are combined with capital from outside the immediate family. Farmers get equity from a variety of arrangements, including partnerships and corporations, pooled funds, joint ventures, or co-ownership (including contracting) of either assets or commodities. In addition to family members, farm implement suppliers, merchandisers, processors, distributors, and other furnish resources to production agriculture. Those who share in net income also bear some of the farm's production risks. In twenty-five percent of farms, equity capital was received for use in production from multiple persons, households, or businesses (figure 13). Farms with these complex organizations produced more than 2/3 of the value of farm output.

Industrialization and Risk Management

Historically, farm operators have reduced risk by producing a diversified mix of crop and livestock enterprises. The food marketing system is evolving from one producing coarse commodities for bulk markets to one creating consumer products for specified markets. Control of input usage, maintenance of product quality, and attainment of economies of size in production will require greater coordination of the various stages of agricultural production and processing, and greater specialization in individual stages by each participant.

Increased coordination is evidenced by the rising use of production and marketing contracts, and the rising degree of coordination between contractors and contractees. While the importance of contracting varies among commodities, almost one-third of total value of 1996 U.S. farm output was produced under a marketing or production contract (figure 14). A higher degree of vertical coordination will allow farmers to spread risks vertically throughout the coordinated farm-to-market production process, as contractors and integrators absorb some of the price risk. Income variability may be reduced for contractee farmers, as they become more specialized producers receiving fee income based on their contribution of service to a production stage within a coordinated production system.

Contractors are providing a larger share of inputs used in farm production of certain commodities. In return, contractors pay the farm operator a fee for the labor, management, facilities and other inputs that the farmer supplies. Contractors typically bear a large share of production and price risk, and earn the majority of net income from the commodity's production. In exchange, farmers may be able to expand their operations more rapidly than otherwise possible, and perhaps, with less debt and fewer financial risks. The proportions in which costs and revenues are shared between farmers and their contractors varies among commodities and generally depends on the amount of input and managerial oversight provided by the contractor.

Farmers' Adaptations to the 1996 Act and Beyond

The challenges facing agriculture will change the way that farmers manage their businesses. Much interest has focused on producers' adaptations to the 1996 Farm Act, and on their use of alternative risk management tools. As the sector relies more on market forces, we recognize that farmers face an increased risk of business failure, as well as increased opportunity for success.

As farm income becomes more variable, risk management becomes more important. As supply or prices of products change, new technologies are adopted, or environmental constraints appear, farmers could experience higher (or lower) income, cash flow difficulties, changing expenses, or more debt exposure. While aggregate income for the sector, or the average net income per farm, could remain stable, variability in income for individual farmers could increase. The probability of extremes in receipts, both high and low, requires farmers to plan more carefully their finances, and production and marketing of goods.

USDA's Agricultural and Resource Management Study shows that indeed farmers are examining ways to respond (figure 15). In 1996, the latest year for which data is available, approximately 20 percent of producers either changed their management decisions or were considering a change, as a result of the new farm legislation. Strategies included in farmers' adjustments were diversification of commodities, forward contracting, hedging, and keeping an open line of credit. Farmers growing program crops (those most affected by changing policies) were, in general, continuing to use the same level of management under the new legislation. Of those who had modified their management strategies, most were considering the use of contracting, diversification and hedging. Operators reported increased adoption of three strategies: maintaining a credit line, keeping cash reserve, and spreading sales over the year. Program crop farmers were using custom work less, perhaps because they were changing their mix of crops. While it is still too soon to project long-term changes in farm operators' risk management strategies that will evolve under a policy of greater market freedom, the 1996 ARMS provides a initial benchmark for following farmers' risk management behavior over time.

Closing Points

The Short-Term Outlook

- o Farm income prospects are strong for 1997 and 1998, but not equal to 1996 record.
- o Cash receipts expected to decline in 1998.

- lower soybean and hog receipts.
- higher cattle receipts.
- o Exports expected to contribute less to farm income in 1998.
- o Most farm households rely heavily on off-farm income.
- o Farm assets, debt, and equity continue to grow through 1998.
- o Farm operators use of debt repayment capacity rises due to lower income and rising debt.

Longer-term Projections

- o Farm income expected to rise at about 2.5 percent.
- o Inflation expected to rise at about 3 percent.
- o Farm sector will face low real growth rates.

Sector Continues to Face Structural Changes

- o Cost containment essential in competitive global markets.
- o Multiple entities share risk as well as income.

Figure 1

Farm income will be about average for the 1990s

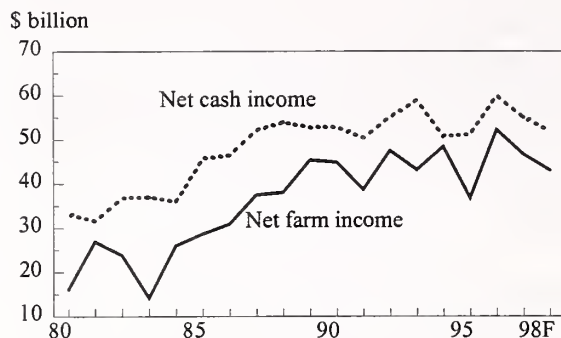


Figure 2

Crop receipts continue to exceed livestock

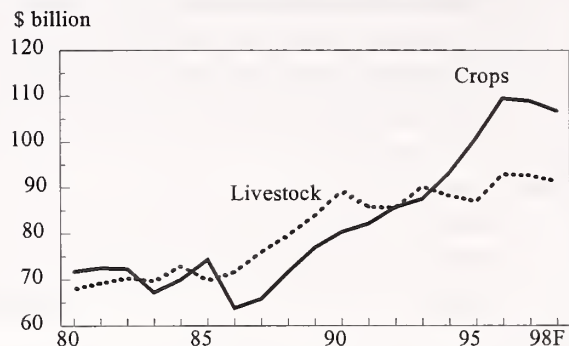


Figure 3

Crop receipts are expected to be lower

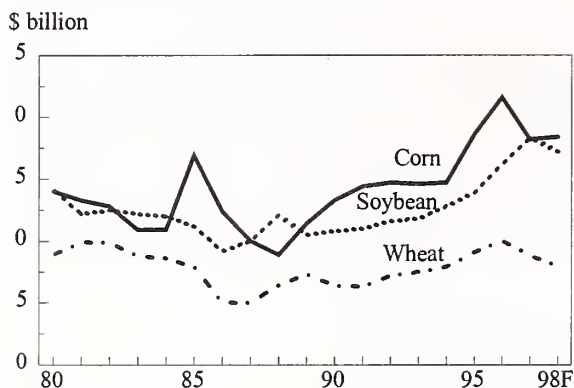


Figure 4

Lower hogs receipts offset rising cattle receipts

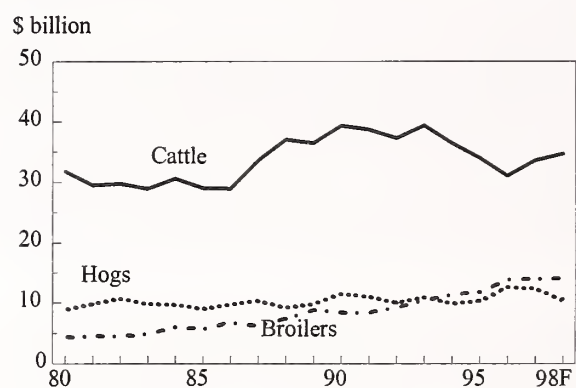


Figure 5

Production expense expected to decline slightly

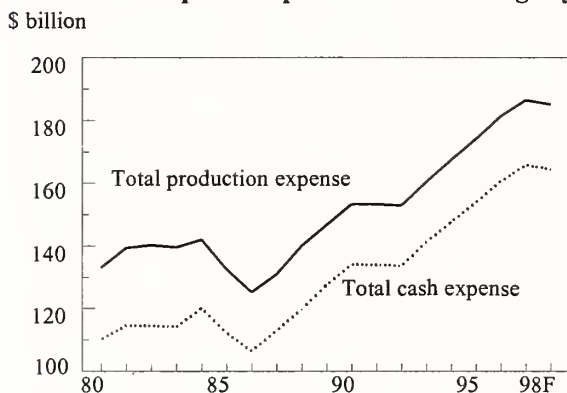


Figure 6

Farm assets, debt, and equity all rising

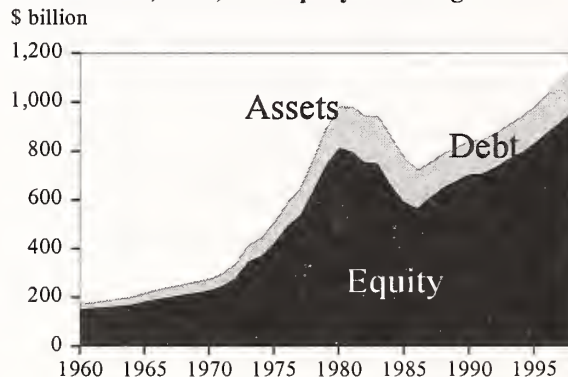


Figure 7

Regional Concentration of Production ?

In 1997, these 7 states accounted for two-thirds of acres planted to corn. Acreage planted increased from 1996.

In 1997, acreage planted to corn declined by nearly 10 percent from 1996.



Figure 8

Year-to-year to changes in farm debt Percent

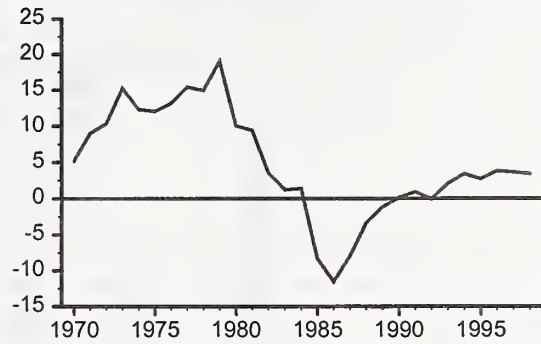
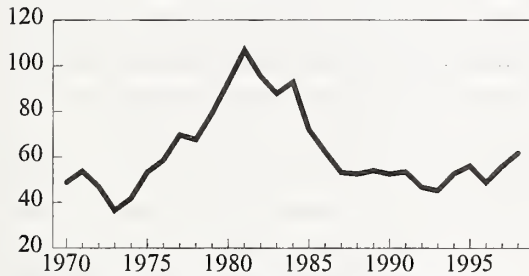


Figure 9

Debt repayment capacity utilization expected to increase in 1997-98

Percent



Actual debt compared with a hypothetical maximum debt that could be carried based upon repayment capacity.

Figure 10

On average, the households of small farms depend heavily on off-farm income, while the households of larger farms depend mostly on farm income.

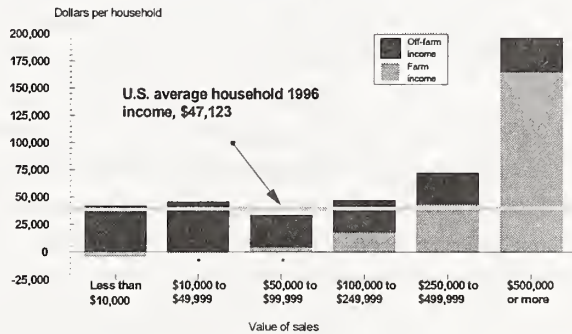


Figure 11

Farm income increases slowly over the baseline period

\$billion

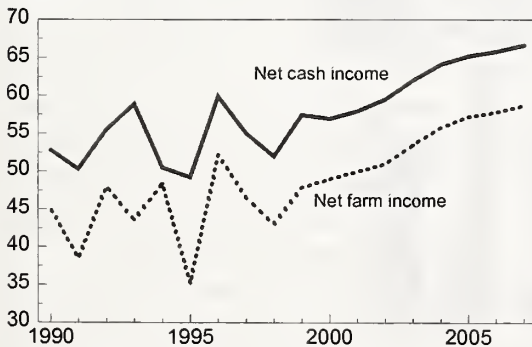


Figure 12

Larger corn farms produce at lower costs

Economic cost per dollar of production

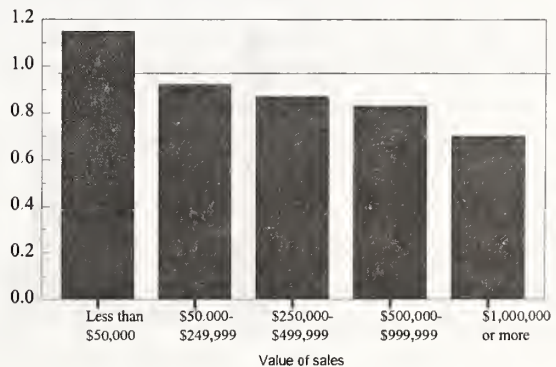


Figure 13
Farming is dominated by single-family farms
But, farms with multiple input-providers control more production relative to their numbers

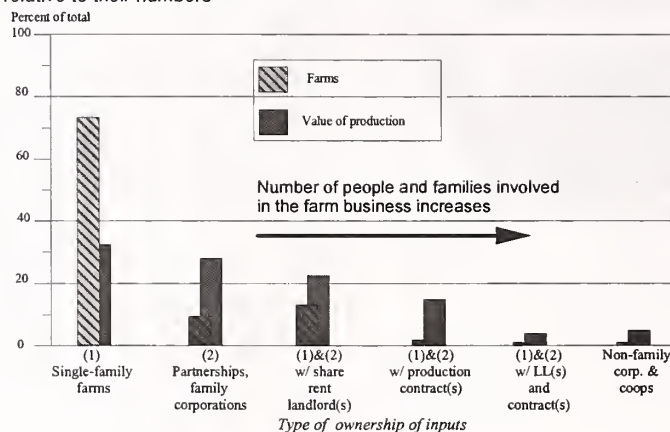
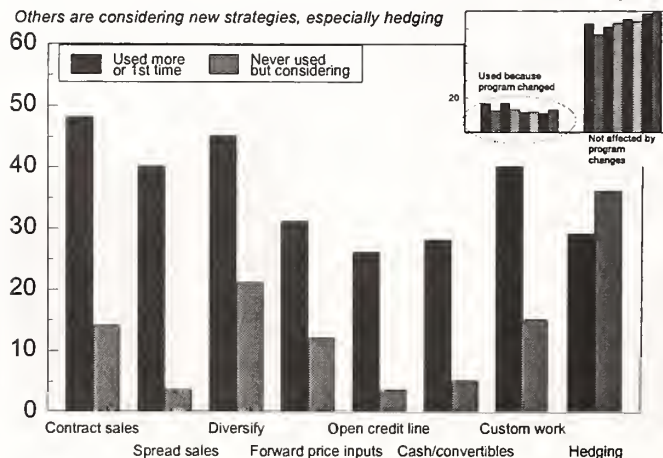


Figure 14
Production and marketing contracts, 1996

	Percent of contracts	Percent of production
Total	100.0	33.0
Wheat	2.1	12.9
Corn	7.3	17.7
Soybeans	5.0	17.4
Fruits/nuts	8.8	52.9
Vegetables	8.5	47.1
Hogs	4.4	32.1
Poultry	27.0	94.1

Figure 15
Farm program changes led to increased use of selected strategies
Others are considering new strategies, especially hedging



U.S. Cotton Production and the FAIR Act of 1996

Robert Carson
Marks, Mississippi

Thank you, Bill, for that introduction, and good morning ladies and gentlemen. It is a pleasure to present my thoughts on cotton production as impacted by the current U.S. farm policy. Since the charge for this presentation was fairly wide open, my comments will include an overview of current policy; what impact it has had on production decisions on Buckskin Plantation, my farming operation; how the new policy has impacted the Delta region of cotton production; and finally some thoughts about the policy implications on the Cotton Belt.

As we are all aware, the FAIR Act of 1996 has changed the mindset of all program crop producers and probably has had at least some impact on the production decisions of all producers. This certainly is the case for cotton farmers. It is no secret that during the farm bill debate, the cotton industry was one of the last "converts" to this new policy which provided total planting flexibility with decoupled income support payments. In fact, until we were able to secure retention of the marketing loan provisions, competitiveness provisions and basically status quo on further payment limits, we did not support the proposed legislation.

But with that bit of history aside, I believe cotton growers have adapted well to this new policy environment. The transition has actually gone smoother than our industry predicted. While some changes in land tenure were made, for the most part, landlords and tenants have gotten comfortable with the new requirements. From time to time, however, we still face administrative adjustments or budget challenges that threaten this transition and which cause producers some concern. It is critically important that USDA carefully consider the disruption to farm operations before making any significant program changes.

Based on industry consensus, one legislative change was made to modify the operation of the cotton provisions, placing more emphasis on the use of certificate payments rather than unneeded import quotas as a competitive measure. Fortunately that change was enacted last year and takes effect this October.

Planting flexibility, where applicable, has been readily accepted and embraced by most cotton producers. Depending upon market signals, producers have made cropping changes that fit their land types and price expectations. One of the side benefits of this added flexibility is crop rotation. Many producers are now able to rotate crops and enjoy benefits of soil fertility improvements and lower pest pressures from weeds, insects and other production problems resulting from continual cotton production. Flexibility has also allowed them to spread their risks and adapt to financing restraints.

However, with this added flexibility comes added uncertainty. Producers have had to pay even closer attention to market signals in deciding their crop mixes. Timely market information is at a premium. They are now required to make decisions sooner in the production year and, in some cases, make multi-year decisions as to tenure arrangements and crop mixes.

Through the years many cotton farmers have attempted to augment profits from cotton production by diversifying into ginning, warehousing and crushing. To date, the FAIR Act's

flexibility provisions that have prompted acreage to shift out of cotton have, at the same time, hurt these volume-dependent enterprises. This outgrowth of flexibility is another factor we must incorporate into our planning processes.

It was disconcerting for agriculture to take such a drastic budget hit in the FAIR Act. We certainly were the first sector of the economy to contribute to the balanced budget efforts of Congress. Fortunately, thanks to the great leadership of our friends such as my Senators' Cochran and Lott, and other Cotton Belt members, agriculture was given credit for these budget savings and spared any further cuts in last year's round of negotiations that led to the balanced budget agreement.

During the first two years of the AMTA payments, cotton farmers have actually received higher payments (amounting to about 11 cents per pound for 1996 and 1997), than would have been received under a continuation of the previous target price program. The real test, however, will be if income support is adequate in the out years of this farm bill when payments decline substantially. On the marketing side of the equation, our Step 2 marketing certificate payments have worked as intended to help promote export sales and underpin domestic consumption. Of course, certificate funds are capped at \$701 million and may be depleted before the FAIR Act ends in 2003.

I would now like to share with you a view of what's happened in my operation since this new farm bill went into effect. Prior to the passage of the current farm bill, our operation was over 90% cotton. I planted corn for the first time in 1996 and again in 1997. Next month I expect to plant roughly 1/3 of my acreage to corn. While acreage devoted to corn could be affected by excessive moisture, growers in my region intend to make a substantial switch if able. Due to extremely poor pricing opportunities for cotton, as I speak, cotton acreage will certainly decrease in Mississippi in 1998 -- to what I believe will be surprisingly low acreage numbers. .

Our growers are fortunate to have the flexibility to plant corn and early maturing soybeans as alternatives to cotton. In my judgment the acreage loss cotton will suffer in Mississippi will be irrigated acres moving to corn. The risk/reward ratio is out of balance for cotton and until that turns around, our industry will suffer at the expense of crops that are cheaper to grow. The benefits of moving to lower cost-of-production crops will be partially offset by reduced returns to our cotton-related processing and handling enterprises.

From my conversations with producers around the Cotton Belt, I think my experiences typify those of many producers. Unfortunately, most growers have operated on slim margins over the past two years because of a number of factors. Some growers may attribute these financial problems to a change in farm policy. However, as I stated earlier, we have actually received more support, to date, under this farm bill than we would have under a continuation of the 1990 farm bill provisions. Our core problem, as I see it, is our inability to reduce production costs in the face of low fiber prices. If our competitors abroad are willing to grow cotton when New York prices are in the low 70's, the message is clear. We have to find ways to reduce our cost of doing business.

The ability to shift crop mixes has actually allowed many traditional cotton farmers who are under financial distress or who have better return prospects from other crops to shift from cotton without any program consequences. If the recent planting intentions survey results released by the National Cotton Council on January 30 are accurate, we will see the most dramatic example of the shift this year. A projected reduction of upland cotton acreage of 12.5% is a significant decline that could result in a nearly 2 million bale production loss from last year.

That certainly has the processing and marketing sectors, as well as our customers, the domestic textile manufacturers, concerned. It comes as no surprise that when looking at intended plantings by region, we saw the largest shifts from cotton in the areas with the highest costs and most options for alternate crops. I am speaking of the MidSouth, which projects a 21+% decline, and the West, which projects an almost 18% reduction. Corn and soybean production in the MidSouth and vegetables, alfalfa and permanent crops in the West, are expected to account for much of the acreage leaving cotton. The market will need to send the proper price signal quickly if it needs increased cotton acreage in the U.S.

Crop acreage shifts and degrees of market volatility are to be expected under this new farm policy. It will take some time for growers to get accustomed to procedures for incorporating these uncertainties into their production decisions.

As with any prudent businessman, cotton growers must continue to adjust to an ever-changing global cotton market and the risks and rewards that result. More and more the work of dedicated trade organizations such as the National Cotton Council and self-help market development efforts such as Cotton Incorporated become critical to the well-being of cotton producers. As we compete in this global market economy with less support from government, we must capitalize on every opportunity to get our costs down on the one hand and boost demand that underpins prices on the other. We must increase efforts to minimize the burden of unneeded government regulations that add costs to our operation and limit the availability of necessary inputs. It is absolutely imperative that sound basic and applied production and processing research be continued and even expanded. We must have fair trade rules that give us access to needed export markets along with government/industry partnerships that develop new trade opportunities. And, yes, we must also look ahead as to what type of farm policy, if any, will follow this act.

Perhaps I have raised more questions than I have answered, but I remain optimistic that in spite of these new challenges, the U.S. cotton farmer will continue to be a major player in the world cotton economy. Thank you for allowing me to share these comments with you today.

**U.S. PORK EXPORT TRENDS:
EXPORT MARKETING AND THE EFFECT OF TRADE AGREEMENTS**

Bill Teeter
Vice President, International Marketing and Sales
Farmland Foods, Inc.

FARMLAND INTERNATIONAL TRADE : SUMMARY

- ✦ International marketing is a critical element of Farmland's growth strategy and access to international marketing is critical to American swine producers
- ✦ Emerging technologies continue to improve and increase US hog production
- ✦ But US per capita consumption of pork is relatively flat
- ✦ Exports have become an increasingly important outlet for American pork
- ✦ An integrated system helps Farmland to be competitive in the international market

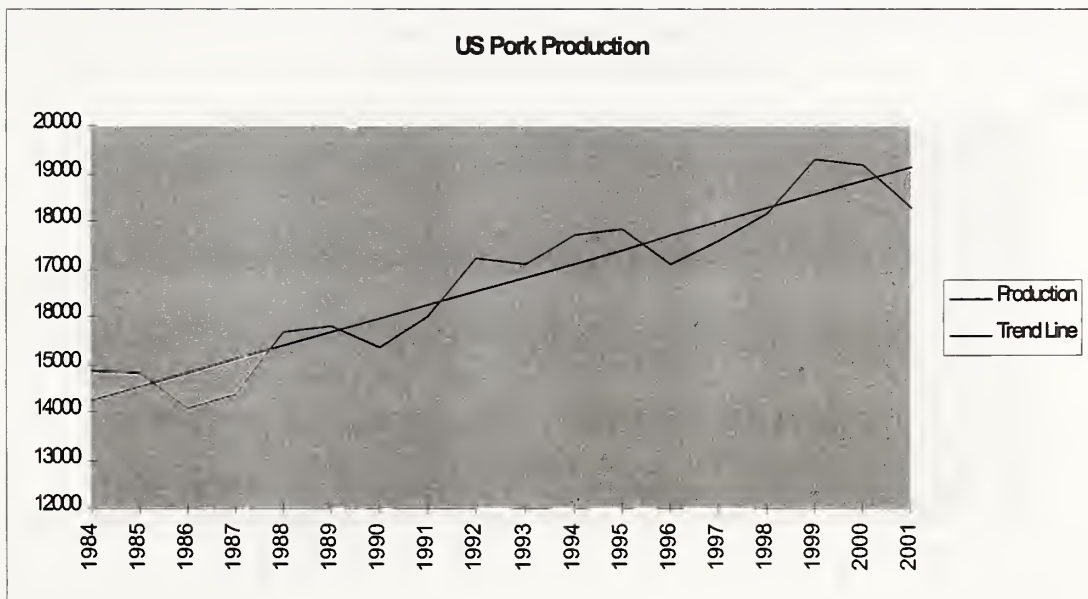


FARMLAND INTERNATIONAL TRADE: SUMMARY

- ♦ NAFTA has had an important impact on US exports to Mexico, however other economic factors also intervene
- ♦ NAFTA impact on trade between USA and Canada less than with Mexico
- ♦ Despite numerous challenges , Farmland business in Mexico and Canada has been positively influenced by NAFTA

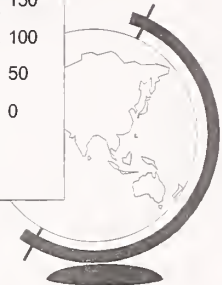
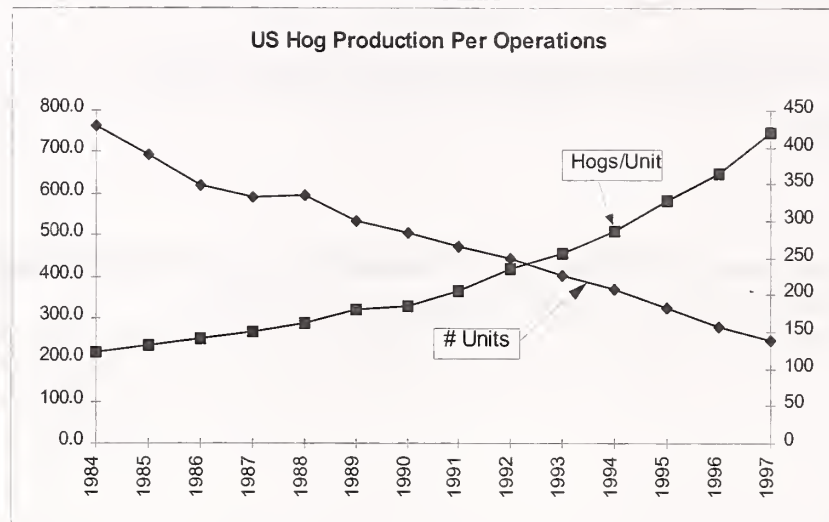


US PORK PRODUCERS ARE EXPECTED TO CONTINUE INCREASING THEIR PRODUCTIVITY AND MARKET DELIVERIES

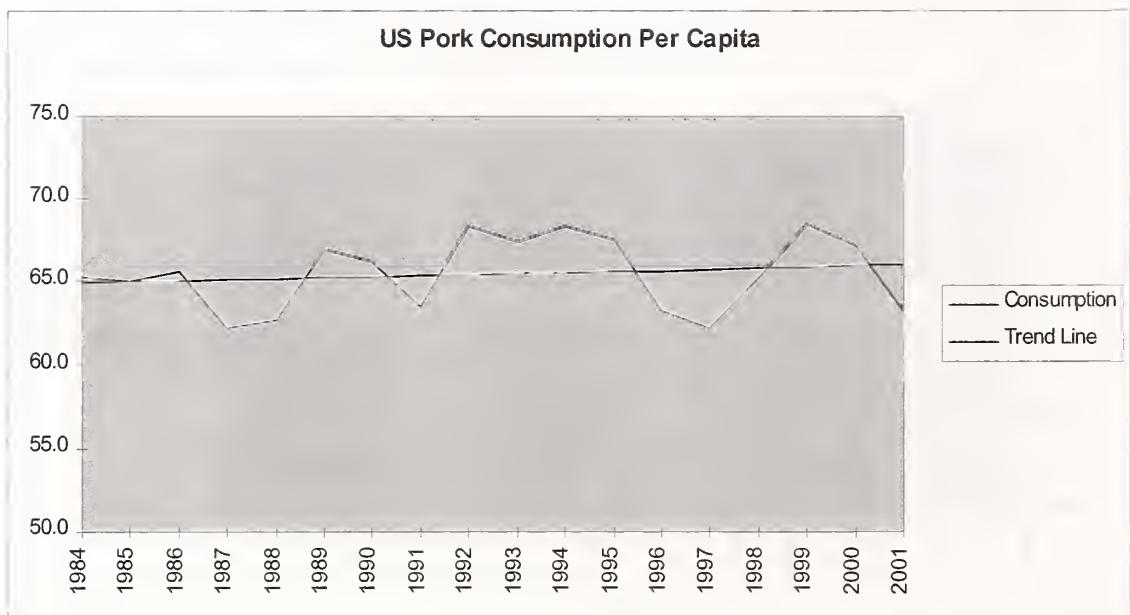


SINCE 1984, NUMBER OF PRODUCERS HAS DECLINED BY TWO THIRDS

NUMBER OF HOGS PER OPERATION IS ALMOST THREE AND ONE HALF TIMES LARGER

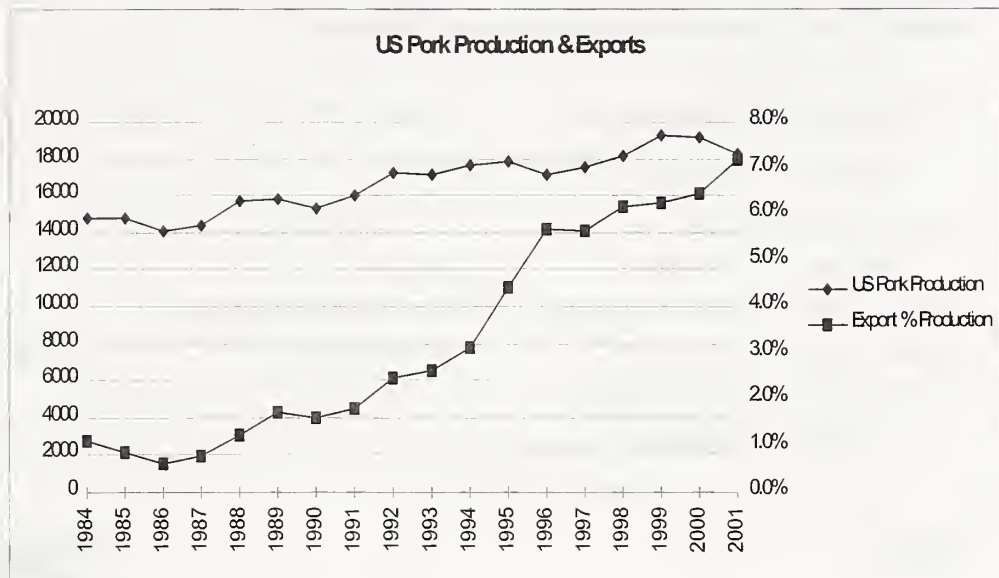


BUT PER CAPITA CONSUMPTION OF PORK MEAT IS GROWING AT A MUCH SLOWER PACE IN THE UNITED STATES

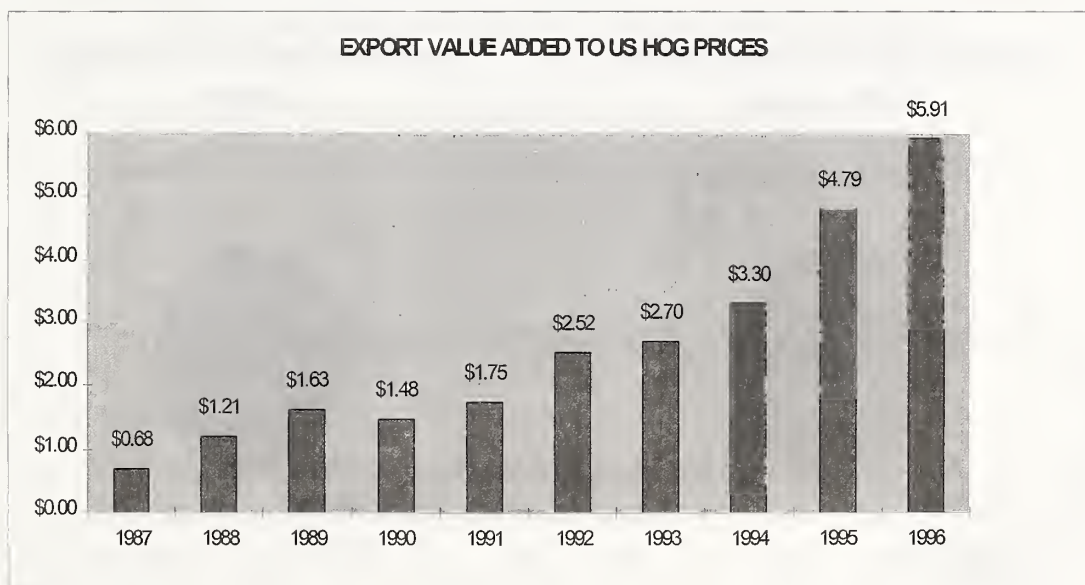


EXPORTS HAVE BECOME AN INCREASINGLY IMPORTANT OUTLET FOR AMERICAN PORK PRODUCERS IN RECENT YEARS.

THEY WILL BECOME EVEN MORE CRITICAL AS WE MOVE INTO THE 21st CENTURY



ACCORDING TO USMEF ESTIMATES, EXPORTS HAVE ADDED ALMOST \$6.00 PER HUNDRED WEIGHT TO THE PRICE AMERICAN PRODUCERS RECEIVE FROM THE MARKET



FARMLAND IS NORTH AMERICA'S LARGEST FARMER OWNED COOPERATIVE FOOD SYSTEM

♦Owned by more than 500 thousand farm and ranch families

♦Integrated agricultural producer and marketer

- Crop Production
- Agricultural Inputs
- Livestock production
- Grain marketing
- Red meat marketing

♦The system exists to support its owners' economic well being

- Lower cost of production
- Access to worldwide markets
- Higher returns for grain and livestock

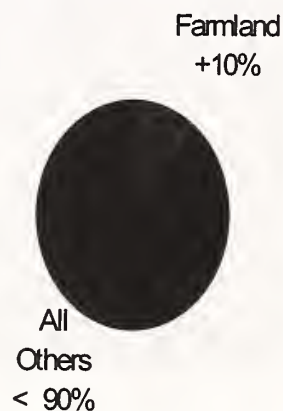


FARMLAND IS WELL POSITIONED IN THE US PORK EXPORT TRADE

Farmland Share of US Domestic Pork Market



Farmland Share of US Pork Export Market



WHEN DEVELOPING MARKETS, CONSUMER SEGMENTS MAY BE CATEGORIZED BY ECONOMIC DEVELOPMENT

<u>Economics</u>	<u>Country Type</u>	<u>Meat Product Preferences</u>
Poor	Developing	Lowest value cuts and processed products
Pre-Consumer tastes	Developing	Less expensive cuts, traditional & diets
Consumer	Developed	Quality, convenience and safety
Elite	Advanced	High quality specialty meats, high value added and convenient with innovative new products



FARMLAND'S DIVERSIFIED INTERNATIONAL MARKET PORTFOLIO ENABLES US TO REACH ACROSS CONSUMER SEGMENTS

- ✦ **Russia, Poland, China**
 - Low cost hot dogs, boneless picnics, variety meats and offals
- ✦ **Philippines, Mexico, Caribbean, Central America**
 - Value oriented prepackaged processed meats, deli meats, primals and offals
- ✦ **Singapore, Hong Kong, Korea**
 - Quality meat products with some regional cut and style preferences
- ✦ **Japan, Canada**
 - Highest quality processed and chilled meat products, special production for sophisticated consumers



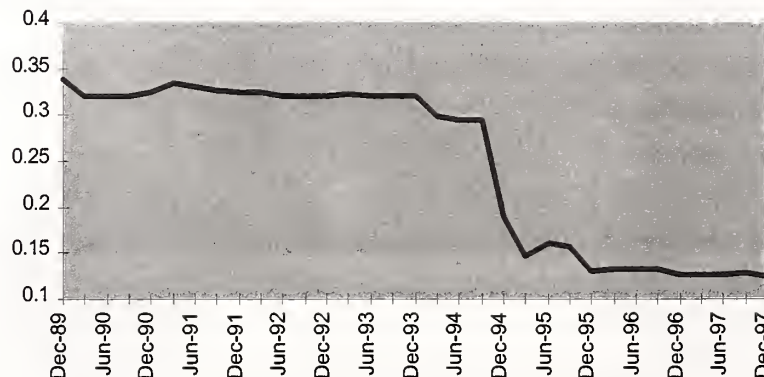
THE NAFTA HAS HAD A POSITIVE IMPACT ON TRADE OF AGRICULTURAL PRODUCTS BETWEEN THE MEMBER COUNTRIES

- ✦ **Meat product exports to Mexico from the USA have increased substantially**
 - All species
 - Late 1994 devaluation caused temporary disruption
 - Recovering economy has renewed growth
- ✦ **NAFTA impact on US/Canada trade has been less noteworthy**
 - 1987 Free Trade Agreement (FTA) already in place
 - FTA provisions “grandfathered” or deferred to GATT implementation
 - Strength of US dollar versus Canadian dollar has favored exports of meat products from Canada to USA



THE MEXICAN CURRENCY SUFFERED A MAJOR DEVALUATION VS THE US DOLLAR SHORTLY AFTER IMPLEMENTATION OF THE NAFTA IN 1994

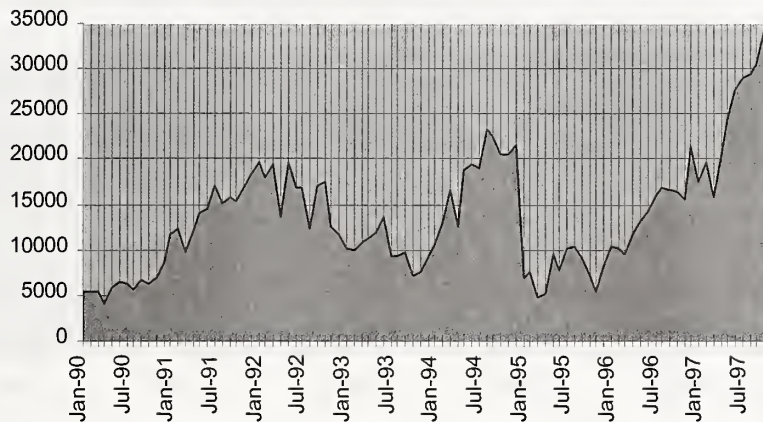
Mexican Peso Versus US Dollar



EXPORTS OF US PORK MEAT TO MEXICO HAVE INCREASED SUBSTANTIALLY SINCE NAFTA

- The late 1994 devaluation depressed demand temporarily
- Economic recovery in 1996 fueled growth

US Pork Exports to Mexico

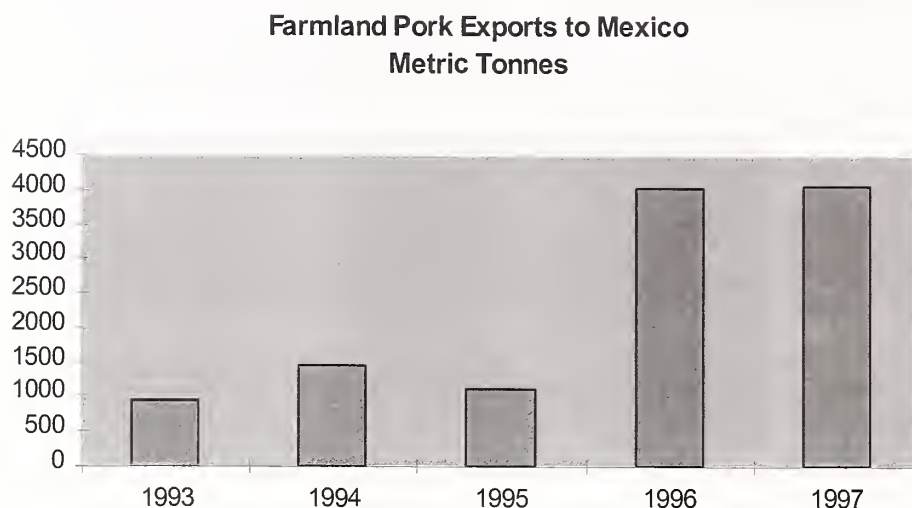


FARMLAND OPENED AN OFFICE IN MEXICO CITY IN 1993 TO PREPARE FOR INCREASED TRADE

- ✦ Improve distribution and sales of grains
- ✦ Develop distribution and sales of meats
 - Already shipping some lower value cuts and offal products
 - Primarily interested in developing market for prepackaged processed meats
 - NAFTA would substantially reduce tariffs on meat exports into Mexico, improving costs of imported meats to final consumer



FARMLAND'S PORK EXPORTS HAVE ENJOYED RAPID GROWTH, ESPECIALLY AFTER 1995



IN AUGUST, 1997 WE INTRODUCED PREPACKAGED PROCESSED MEATS INTO THE MEXICAN MARKET FOR THE FIRST TIME

- ♦ **Began with limited distribution into Mexico City**
- ♦ **Have now expanded to all Sam's and WalMart stores throughout Mexico and increased number of supermarkets in Mexico City**
- ♦ **First products shipped with US labels**
- ♦ **Have now developed an expanded line with Mexico specific, Spanish language labels**



MEXICO IS NOW A STRATEGIC MARKET FOR FARMLAND

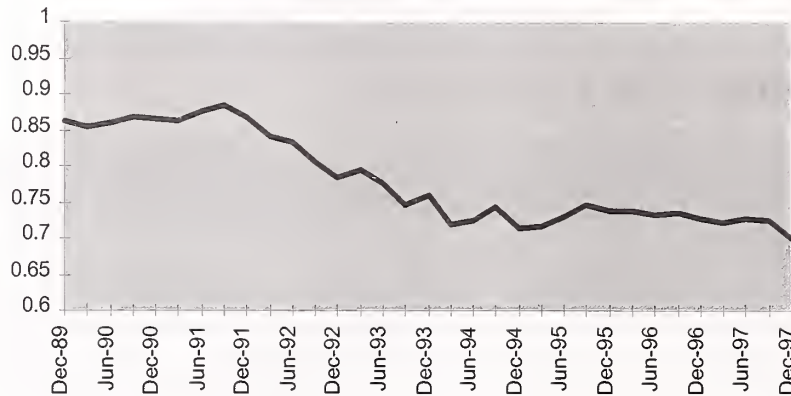
- ✦ Mexico is expected to be a key growth opportunity
- ✦ Recently strengthened organization
- ✦ Have begun advertising campaigns in Mexico City to improve awareness of the Farmland brand
 - Outdoor signage
 - Bus panels
 - Trade shows
- ✦ *Importantly, Farmland “toughed it out” during the currency related economic dislocation and is now positioned to reap the benefits*



NAFTA AND EXPORTS TO CANADA

**THE US DOLLAR HAS BEEN STEADILY STRENGTHENING
VERSUS THE CANADIAN DOLLAR OVER THE PAST
SEVERAL YEARS**

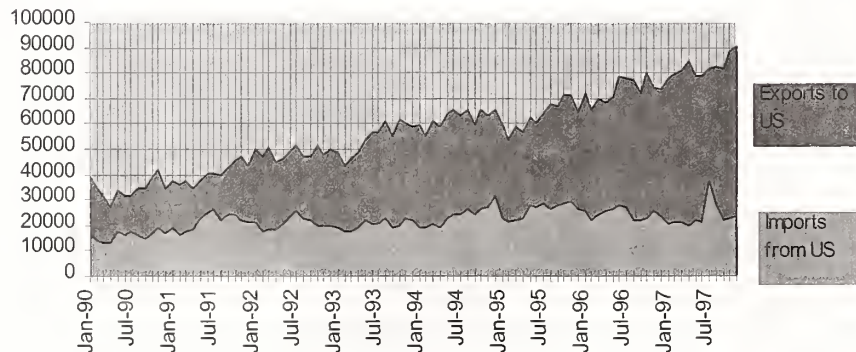
Canada Dollar Versus US Dollar



**CANADA WAS A NET EXPORTER OF PORK MEAT TO THE
USA BEFORE NAFTA**

**CANADIAN EXPORTS HAVE GROWN WITH THE
WEAKENING OF THE CANADIAN DOLLAR**

Canadian Exports to USA and Imports From USA



FARMLAND EXPORTS INTO CANADA HAVE BEEN MINIMAL, BUT EFFORTS UNDERWAY TO DEVELOP THE MARKET POTENTIAL FOR OUR PRODUCTS

- ✦ **Developed some limited fabricated pork trade in late 1997**
- ✦ **Have been discussing prepackaged product opportunities with key trade factors in Canada**
- ✦ **Held full day seminar in January, 1998 on “How To Export Meat Products to Canada”**
- ✦ **Currently developing bilingual labels for a limited line of products which will be highly differentiated for Canadian consumers**



IN SUMMARY, INTERNATIONAL TRADE IS A KEY ELEMENT OF MANY AGRICULTURAL BASED COMPANIES IN THE US.

NAFTA AND OTHER TRADE AGREEMENTS CAN HELP OPEN ACCESS TO US PRODUCERS

- ✦ **Agricultural exports from the USA to Mexico have grown substantially**
- ✦ **Mexico has become a strategic market for Farmland**
- ✦ **NAFTA has had less of an impact on trade between Canada and USA**
- ✦ **However, development of the Farmland brand in Canada is underway, because...**
- ✦ **NAFTA HAS CREATED A MUCH MORE ACCESSIBLE AND INTEGRATED NORTH AMERICAN MARKETPLACE FOR PRODUCERS AND CONSUMERS**



CHALLENGES FOR INTERNATIONAL MARKETING IN THE COMING DECADE

Barbara Hutchison
Manager, International Membership
Food Marketing Institute
Washington, D.C.

Thank you, Jim. I am pleased to be here with y'all today to talk about the challenges for international marketing in the coming decade. As Jim said, I am Barbara Hutchison of the Food Marketing Institute, located here in Washington, D.C. For those of you who are not familiar with us, FMI has been a leader in the supermarket industry for over 60 years. We are very often known only for our industry trade show that we host every year in May in Chicago. However, our main function is to serve and represent our members--food retailers and wholesalers across the United States and throughout the world.

Our retail membership is composed of large multi-store chains, small regional firms and independent supermarkets. Our domestic member companies operate approximately 21,000 retail food stores with a combined annual sales volume of \$220 billion dollars--which is more than half of all grocery sales in the United States. Our international membership includes 200 members from over 60 countries.

The underlying theme to keep in mind when looking at the challenges of marketing in the world arena is keeping pace with change. Emerging trends in international retailing are all responses to change. The key areas to focus on are competition, technology and human resources.

Challenges

Competition in the supermarket industry has become more complex and diverse. Every year we survey supermarket C.E.O.s around the world. Competition has been ranked as the number one issue for the past four years. I believe competition can be defined as anything or anybody who is taking away your business, customers or market share. It can come from within the same industry or from outside. It is becoming increasingly more difficult to define who exactly is our competition.

Drugstores, discount stores, club stores, supercenters and even restaurants are all chasing the same consumer that supermarkets are. The lines are blurring as everyone battles for a share of the consumer's stomach. Throughout the world, supermarkets are hoping to regain food sales lost to quick-stop convenience stores by countering with some convenience of their own, such as selling gasoline. This one-stop-shopping trend is seen in Australia, the United Kingdom and even here in the U.S.

Supermarkets are now competing with restaurants in light of a new consumer trend that we see here within the U.S. but is equally applicable around the world. It's a trend we call meal solutions or home meal replacement. American society has changed--more than 50 percent of women are working outside the home full-time. Thirty years ago this would have been unthinkable. Society is changing. We see more women in the workplace with less time to cook. More people are eating out of the home and eating fast food.

Twenty years ago the supermarket industry made a mistake. We didn't respond to the fast food trend. We didn't define restaurants as competition. We thought people were eating out just because it was fun. However, total spending on food-at-home by families and individuals is now 6.7 percent of disposable income, declining from approximately 12 percent in 1965. Total spending on food-away-from-home has increased from approximately 3 percent to 4.3 percent of disposable income. The grocery industry is now trying to make sure that when the consumer asks the question "What's for dinner?" that supermarkets are one of the answers.

When we surveyed our membership as to whom they saw as their top competitors, here is what we heard: Seventy percent said that existing supermarkets were their top competitors while 53 percent responded with new supermarkets. A third of respondents said it was supercenters; 20 percent replied that it was restaurants, which is interesting because five years ago we didn't even have them on the radar screen. And finally, 8 percent answered category killers. (Actually, I believe the politically correct terminology would be category enhancers. These are retailing concepts, such as Petsmart and Starbuck's, where a whole store is built around a single category. The original term came from the concept that when a store of this nature opened near a supermarket, it would kill the sales in that category for the grocery store; hence the term category killer.)

The impossible happens! One-seventh of the American population goes to McDonald's every day. We now see co-location of McDonald's with or in grocery stores. The impossible happens! Wal-Mart is ranked within the U.S. top 10 leading supermarket and grocery chains, with retail grocery sales approximating \$8 billion annually. Fifteen years ago, supercenters weren't on the radar screen either.

There are challenges and opportunities when marketing internationally. The key to marketing, globally or otherwise, is serving the consumer--knowing the shoppers, what they want, what is important to them; giving them excitement and value. A French magazine called *LSA* published a study several months ago that looked at what attracted people when buying foreign foods. They found that the purchase of foreign foods gave purchasers a sense of discovery. In addition, it gave them the opportunity to experience pleasure and new taste sensations. For the retailers, stocking these items showed an action step, a move toward nonconformity and a means of building or retaining their current customer base. It also gave those retailers a competitive advantage by making the store and the product stand out. Retailers also viewed it as a value added service plus an opportunity for mark up.

As economies become global and the world begins to become more homogenous, it is still good to keep in mind the phrase "Think globally, market locally." This same French study looked at issues to examine when marketing foods in other countries. Issues to consider include how appropriate or relevant the product is to the local consumers. This could be in terms of taste,

such as sweet or salty; in terms of diet, such as lactose-adverse; in terms of culture, customs or religion, such as selling beef in India, or in terms of appropriateness, such as after dinner mints in Bangladesh. Other issues to consider include educating consumers on how to use the product, developing packaging and instructions that they will understand, and the availability of recipes.

There are constant reminders of marketing gone bad. What about the time Chevy marketed the Nova in Latin America? Once they found out that "Nova" in Spanish means "doesn't go", they understood why it wasn't selling. Or what about Kentucky Fried Chicken translating their slogan "Finger Lickin' Good" into Chinese which literally meant "to eat your fingers off"? There was also the company that produces baby foods. When they began selling their product in Africa, they used the same packaging that was used in the United States. Their label featured a picture of a sweet, smiling Caucasian baby. They later learned that most people can't read English in this country, so companies routinely put pictures on the label of what's inside.

We could go on, but the bottom line is that the real cultural differences lie in the way people think and this is what we must tap into. Competition--it's complex, it's diverse and it's changing. And sometimes, this is as good as it gets.

The second key area of change is technology. This is an international trend and it is changing the way everybody does everything. For example, in Costa Rica, cellular phones are extremely popular. When asked about this proliferation, people explain that land lines are unreliable, expensive and there is a long waiting period for installation. In comparison, cellular technology is convenient, relatively inexpensive and easily accessible. This technology has changed the way this country communicates and has made their lives easier.

People around the world are looking at how technologies can be used to simplify their lives. In response to this, we see grocery retailers are beginning to utilize technology as a marketing tool as well as a means of customer feedback. We see traditional retailers offering home shopping and home delivery via the Internet; many of our member companies now have websites. Global food retailing is a highly complex logistical business. Advances in technology affords more efficient ways to move food from farm to table. Technology brings the world together.

Again, the underlying theme is change. Look at technology. Does everyone remember the days of 45-r.p.m. records and that little yellow disk that went in the middle? If you didn't have that little plastic thing, you couldn't play the record. That in its day was high tech. Just think about these markers of change: personal computers, VCRs, cell phones and the Net.

Here again the impossible happens. Amazon.com, the largest bookstore in the world, doesn't exist except in cyberspace. Electronic payment is not just the wave of the future; it's here now. When was the last time that you actually held your pay check in your hand? I can't remember; my pay goes electronically from my employer, FMI, to my bank account. When was the last time that you used a real bank teller person rather than the ATM or other electronic means? In fact, some businesses charge extra if you want to work with a real live person.

The final area has to do with human resources. The grocery industry is a service industry and is therefore a very labor-intensive business. We began as a highly personalized business where each customer's order was hand selected and have progressed to a self-service environment with very little interaction with our customers.

Now, we're striving for a happy middle ground. Human resources as a marketing tool is not doing so well in our industry. We need to find ways of training people in the art of selling and in the art of customer service. One of the best means of marketing is front line personnel. These are the people who are in constant contact with customers, so having employees who are knowledgeable and friendly will give consumers a happy, enjoyable shopping experience--one that they want to come back to.

The supermarket business is an extremely local, neighborhood business. Eighty-five per cent of FMI's members are independent operators, which means they operate 10 stores or less. However, it is also becoming a global business which we can't ignore. We see multinational companies operating throughout the world. An example of this, in our own backyard, is Giant Food, which is owned, in part, by Sainsbury's--out of the UK. Another example is Carrefour, out of France, who is on the verge of opening a second store in Singapore. These companies have the ability to see trends across countries and across continents.

Retailing has expanded beyond country borders and products now flow around the globe. Consumers are becoming more worldly. The example our CEO always gives is teenagers; they are the consumers of the future. No matter what part of the world you are in, teenagers are plugged into the Internet, consume MTV, wear Nikes and often behave the same. Tastes will shift and become more global. Shopping by the Internet will become more commonplace. Virtual retailing will expand to the extent that many shopping malls will be created that, in reality, never existed except on the Internet, much like Amazon.com.

Selling solutions and new partnerships go hand in hand. International competition will see companies from different industries, different countries and different continents teaming up together to create global economies, buying leverage and solutions. International marketing in the future, as it is now, will be a matter of serving the consumer, keeping up with change, thinking globally and marketing locally.

I have to tell you, I don't have a clue who Elbert Hubbard is or whether he really said this or not, but I thought this was a great quote: "The world is moving so fast these days that the man who says it can't be done is generally interrupted by someone doing it." It sums up the challenges of international marketing and what we can expect for the future--and that is change. I appreciate your time and thank you for joining me today.

POTENTIAL FOR DAIRY PRODUCT EXPORTS

Tom Suber
Executive Director, U.S. Dairy Export Council

Good afternoon. The title of this presentation was originally "New" Potential for Dairy Product Exports. It was intended to lay out how a number of supply and demand factors were converging to make U.S. dairy products -- both commodity and value-added -- more competitive in export markets.

One of the favorable supply side factors has been the progress that recent trade agreements, such as NAFTA and the Uruguay Round of GATT, have accomplished in dropping tariff barriers and export subsidies that artificially lower world prices. Constraints on EU dairy subsidies, especially for cheese, are allowing world dairy commodity prices to rise to more accurately reflect true supply and demand. In addition, the joint efforts by the U.S. dairy industry and our government to force compliance with export subsidy rules, as in the current WTO disputes with Canada and the EU, are intended to ensure that supply is determined by the rules of the market rather than programs intended to guarantee incomes for overseas dairy producers.

On the demand side of the equation, the quick service restaurants have had a strongly positive effect. Their successful and increasing investments in overseas markets is driving a more diversified diet in Asia that now includes dairy products in pizza, hamburgers, ice cream and other processed foods.

The most positive demand factor of recent years, however has been the rapid economic growth of the Asian and Latin American economies. The dramatically rising per capita incomes of hundreds of millions of consumers have led them to demand more animal protein in their diets; that means, beef, poultry, pork and dairy products.

All these factors have led to similar conclusions from an unusually wide variety of analysts, such as those from our competitors in New Zealand, Holland, and Denmark, as well as such major buyers as Nestle's and Japan's Snow Brand. They all projected that within the next five to seven years, demand increases were going to severely tax available supplies. These developments have been reflected in both international prices and U.S. export gains.

But, then, came the current economic problems in Asia. Since November, questions -- from processors, producers, Congress, USDA, the press, my wife -- have been constant: Is the growth path for U.S. dairy exports a mirage? Will our dairy products be faced with a depressed world market demand and price, which we will be increasingly unable to address with our own declining level of subsidies?

These questions required a revised focus for this speech. Instead of the medium and long term, I will focus on the next year or so, and how Asia's recent economic problems will affect U.S. dairy exports.

Three issues here are of primary concern: volatile currency fluctuations, retarded economic growth and the strength of the dollar. The first two issues affect demand for any imported dairy products, while the latter affects U.S. competitiveness in the face of that demand.

Currency fluctuation is the key short-term issue since, as with the Mexico devaluation in early 1995, buyers defer purchasing decisions when widely fluctuating currencies obscure what one's final costs will be. Until currency rates settle down and importers can determine what their costs are, paralysis will prevail.

The other issue affecting demand is the stagnant growth and dwindling consumer purchasing power in many of these markets. Finally, the relationship between the Australian and New Zealand dollars with the U.S. dollar goes to U.S. competitiveness. Currently, the Australian and New Zealand currencies are at 10-year lows to the U.S. dollar. In many markets some U.S. dairy products are running 100% higher in price, while Australian and New Zealand products are "only" 60% more expensive.

In our opinion, the higher value products are the most vulnerable.

Ice cream will be the most affected throughout Asia by the loss of consumer purchasing power; last year about 46% of all U.S. ice cream exports (15,195 MT in first 10 months of 1997) went to Asia. Sales have already been plagued for some time by tightened consumer budgets, and the current economic situation will tighten consumer purchasing further.

Cheese exports will decline in some markets. South Korea, which accounts for 13% of all U.S. cheese exports (4,051 MT in first 10 months of 1997), and Southeast Asia, which accounts for about 6% of all U.S. cheese exports (1,128 MT in first 10 months of 1997), have taken and will continue to take the biggest immediate hit. However, Japan, which accounts for 16% of all U.S. cheese exports (4,751 MT in first 10 months of 1997), will likely not be affected.

Skim milk powder will be less affected by the lack of new orders in the near term, due to the fact that the DEIP allocations for Asia have already been used up and new allocations are not set to be announced until July. However, shipment of some contracts has been postponed due to the economic situation.

Whey products, of which about 58% of total U.S. exports (52,350 MT in first 10 months of 1997) are in Asia, can see greater opportunities once currencies have stabilized since many manufacturers are looking for ways to lower ingredient costs. Similarly, lactose has greater potential in some markets, owing to the increased production of infant formula.

The effect on U.S. exports will differ in each market.

Hong Kong/China

Chinese imports will probably be the least affected due to the relative stability of the Hong Kong and Chinese currencies against the U.S. dollar. But neither Hong Kong nor China consumes large quantities of U.S. dairy products at retail anyway. Generally, most of the end-users of dairy ingredients have expressed a "business as usual" attitude. Therefore, we expect existing export projections to be on target.

Japan

Japan has also not been substantially threatened by the current problems. Despite the prolonged economic stagnation, dairy consumption continues to grow. The fundamental strength in dairy products, which is unchanged, has been its contribution of calcium to the diet, in which Japanese consumers are chronically deficient. Despite continuing economic doldrums of only about 1% economic growth, the upward movements in both the consumption of dairy products and imports are expected continue.

In fact, due in part to continued reductions in EU subsidies and a long-standing market development program, U.S. cheese exports can be expected to increase about 1,000 metric tons this year. In whey products, imports from the U.S. will likely grow, as many Japanese food processors using skim milk powder may look to reduce costs and consider whey as an alternative ingredient. Since most whey products are imported under quota, the growth rate is expected to be moderate at 5-10% over 1997. Ice cream is the only area in which we may see a decline. Our ice cream is in the more expensive premium ice cream category, which is susceptible to tight consumer budgets.

South Korea

In South Korea, currency fluctuations, the strength of the U.S. dollar and liquidity problems have profoundly affected sales of most U.S. dairy products over the last two months and will continue to do so in the short-term. Consumer-ready products have been the hardest hit. Ice cream in particular has not only been affected by the reduced purchasing powers of consumers, but also by the "Buy Domestic" movement within the country. Importers of cheese, primarily mozzarella, are depleting inventories of imported cheese, most of which will last only until the end of February, placing orders for imitation product and increasingly considering Oceania sources in light of their more favorable currency rate compared to the U.S. dollar. In the medium term, U.S. cheese exports can be expected to resume, but U.S. competitiveness will depend in large part on the strength of the U.S. dollar at that point. Some buyers in the market speculate that once the exchange rate reaches around US\$1:1,300 won (currently at about 1700 won), or at the point when U.S. mozzarella becomes less expensive than the local product, they will resume purchases of U.S. cheese.

Imports of whey and lactose from the U.S. will continue to increase, but at a slower pace than last year. Manufacturers of infant formula, a large user of lactose and whey protein, expect demand to grow over the next quarter as more women enter the workforce with second jobs.

Southeast Asia:

In Southeast Asia, in spite of currency fluctuations and economic problems, we expect consumption of dairy products to grow throughout the region, especially since market growth is

largely fueled by government school milk programs. Sales of sweetened condensed milk will remain flat, while sales of imported premium ice cream are likely to decline in favor of locally produced product. The future of the recent steady growth in yogurt and mozzarella is tied to the pending stabilization of the economies. Additionally, as manufacturers look for ways to lower ingredient costs, the market for whey products throughout the region should remain strong. The current position of the U.S., as predominately a supplier of dairy ingredients rather than retail products, should largely shield U.S. dairy exporters from adverse effects in the retail and foodservice sectors.

Indonesia

Indonesia has been one of the hardest hit by the currency crisis. Per capita income has dropped in real dollar amounts over the last few months and concern is rising about political and social unrest. Hoarding of food products has meant that long-life dairy products are sold out. Dairy manufacturers are reducing inventory to raise cash, and difficulty in securing letters of credit and a shortage of dollars are limiting imports. One positive result is the Indonesian government's decision to include agricultural goods in a general program of tariff reductions. As of February 1, all Indonesian tariffs on food items have been cut to a maximum of 5% while local content regulations on dairy products have been completely abolished. Additionally, for U.S. exporters of feed-grade whey, tariffs on non-food agricultural products were reduced by 5% to a maximum of 10% by 2003. In spite of this increased market access, Indonesia remains the most problematic for the near term.

Malaysia

Malaysia has seen a significant drop in consumption over the last month, in large part resulting from the Muslim period of Ramadan. There are campaigns promoting domestic products over imported food products, but as with all Southeast Asian countries, local dairy production is insufficient to meet consumer demand. Indeed dairy products consumption has not been overly affected, with the exception of imported premium ice cream.

The Philippines

While the Philippines has experienced the devaluation of its peso, dairy consumption remains strong and is likely to continue to increase owing to parental concern over their children's nutrition. Canned milk is a prime commodity and Filipinos are hoarding quantities of sweetened condensed milk. There is not likely to be any growth in the canned milk market this year, but the majority of Philippine dairy manufacturers are still forecasting double-digit growth in all other sectors.

Singapore

Singapore has seen a significant drop in retail sales, although by volume 1997 sales were 4-5% higher than in 1996. Fresh milk sales grew 12% while skim milk powder sales grew 8%. Sales of lower value products such as UHT milk, full-cream powdered milk, and condensed and evaporated milk stayed flat. Similar results are forecast for 1998.

Thailand

Despite Thailand's problems leading to the IMF bailout, its dairy consumption is projected to grow. As part of its agreement, the IMF agreed that the Thai government's school milk program,

which underpins demand for dairy products, should continue. As a result of the economic climate, buyers are currently reducing their inventories and profit projections of dairy manufacturers are down. The result is that dairy consumption is now forecast to increase by 10-15% from 1996, which although down from the 20% growth previously forecast, is still ambitious.

Conclusion

In conclusion, let me emphasize a few things. First, as serious as the situation is in Asia, it is temporary. The economic fundamentals are in place to ensure a recovery. The big question, of course, is when? For a testament to the resilience of the economies of developing countries, look at Mexico....

Secondly, regardless of the current situation in Asia, the U.S. dairy economy has little choice but to look towards export markets for its future growth path. The loss of price supports in 22 months, the steady decline in available export subsidies, and the continuing ability of milk production in the western United States to profitably expand at prices considerably below the national average, is setting this future for us. Therefore, it is imperative that our industry continue to identify and invest in those markets and products best suited for export expansion.

Thank you for your attention.

AGRICULTURE IN A NEW CENTURY:
WHAT ROLE FOR USDA INFORMATION?

Mark Drabenstott
Vice President & Economist
Federal Reserve Bank of Kansas City

Information is a critical issue for the future of the U.S. Department of Agriculture. While the Department has always played a critical role in providing information on U.S. agriculture in the past, this role will, if anything, be more important in the future. Many would argue that agriculture is moving into an information age, where information becomes the crucial ingredient, supplanting seeds, livestock, and markets. Just as the role of information is changing, however, so too is the type of information that everyone from farmers to processors to policymakers needs. Therefore, the question before this session is a very important one: What role will the USDA have in providing information to changing agriculture of today and tomorrow?

My goal today is to provide a broad framework for assessing the USDA information role. It is not within the scope of this brief session this afternoon to bring forward a detailed list of what information should stay, what should go, and what should be added. Rather, it may be more useful to offer a framework from which these details might be addressed.

Three questions define this framework. First, how has the world of agriculture changed? Second, given those changes what are the new information priorities? And third, what is the USDA's information niche in light of the above?

Stated briefly, my conclusions are these. For more than a century, the Department of Agriculture has been writing the book on U.S. agriculture, commodity after commodity, chapter upon chapter. But the actors in the agriculture of the 21st century no longer use all of this book. Instead, they need a broader web of information that spans the farm gate to the dinner plate, the fruited plain to the distant port. And even as business decisions have become more complex, so have the policy decisions. For businesses and policymakers, the Department of Agriculture still is the only author for key pieces of information. But the times call for a new web, and to do so probably means giving up some chapters in the old book.

HOW HAS THE WORLD CHANGED?

Before describing the agriculture of today and tomorrow, it is useful to recognize where we have been. The agriculture of *yesterday* focused on:

- Government programs;
- Commodities;
- Commodity markets;
- Family farms; and
- Domestic markets.

There was an information assumption attached to this general structure of the industry. The assumption was that if the Department of Agriculture supplied unvarnished information on commodity markets, then family farms would flourish, and rural America would prosper. A less explicit, if no less important, assumption was that if farmers respond to a barrage of commodity information, then consumers will be happy. Both assumptions are now in question because the very nature of U.S. agriculture has changed so dramatically.

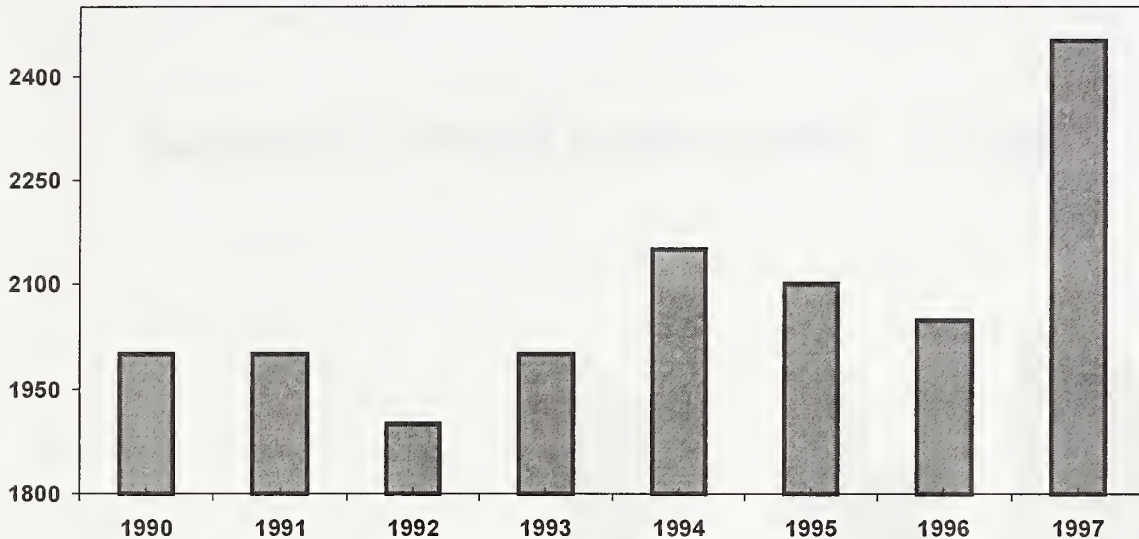
With dramatic change in agricultural markets, agricultural policy, and the structure of the industry, the agriculture of *tomorrow* will focus on different things. Specifically, the focus seems likely to shift to:

- Market signals;
- Products, less on commodities;
- Contract markets, less on spot markets;
- Farm alliances, not homogeneous farms;
- Domestic and global markets;
- Rural America; and consumers.

The shift in focus is evident in a number of changes underway in U.S. agriculture. First, producers are becoming much more responsive to commodity market signals. In the wake of the new farm bill, farmers are clearly no longer wedded to Washington commodity program signals. In the Heartland, for instance, Kansas farmers were quick to respond to high soybean prices and the loss of their wheat base by boosting soybean plantings sharply in 1997 (Chart 1).

Chart 1. Soybeans in Kansas

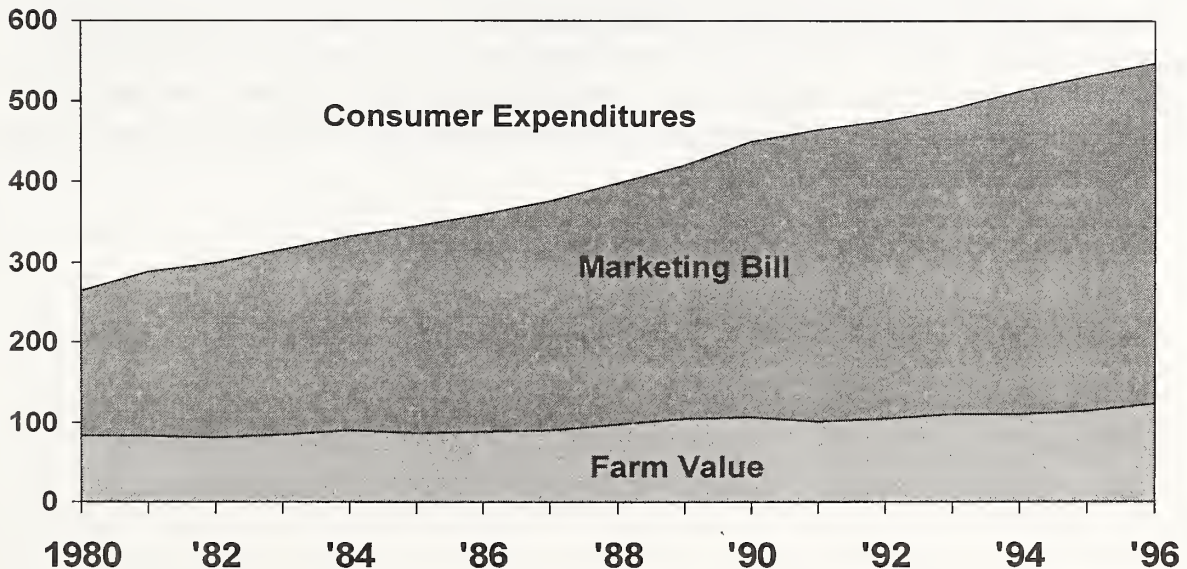
Thousands of acres



Second, lines are blurring in the food system as farmers shift to new generation products. Historically, U.S. agriculture has been marked by sharp lines of distinction between production, processing, distribution, and retailing. Increasingly, farmers view themselves as participants in other segments through such innovations as identity preserved products, which transcend traditional lines. Thus, the very concept of a food marketing bill, a standard chart of the old agriculture, may need to be rethought (Chart 2).

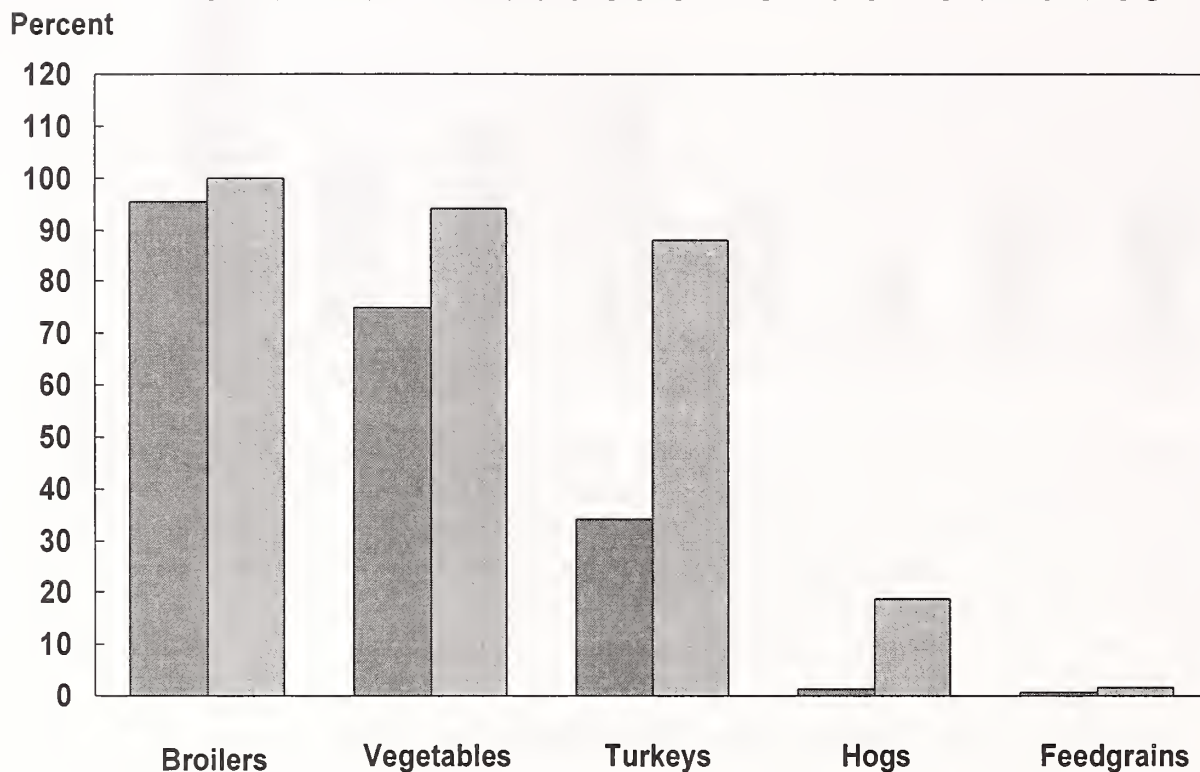
Chart 2. Food Marketing Bill

Billion dollars



Third, industrialization promises to be a powerful force bringing more change to U.S. agriculture. Contract production is spreading to more and more commodities, and the share of total production under contract is rising rapidly in some cases, such as hogs (Chart 3). This trend gives few signs of abating. Indeed, in a new market era, contracting seems likely to increase as producers find new ways to manage risk.

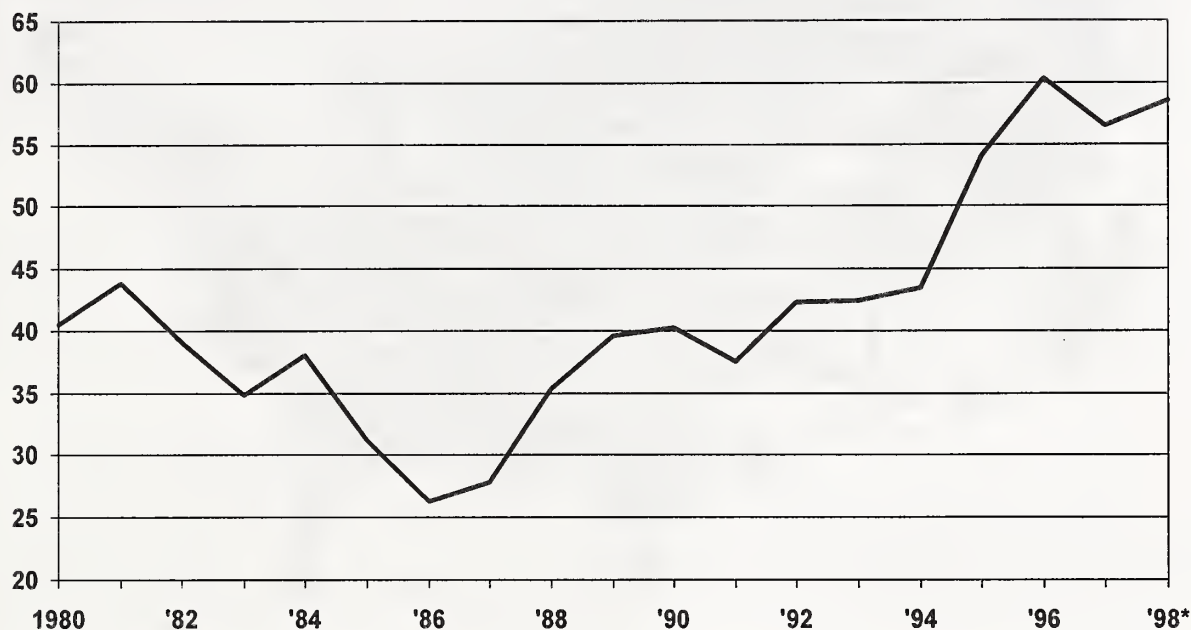
Chart 3. Production Under Contract



Fourth, globalization may be an even more powerful force. Many of U.S. agriculture's institutions--whether market institutions or policy institutions--were designed for a domestic industry. While many of those institutions have evolved and adapted to a more open sector, the fact remains that globalization will continue to have a major impact on information needs as the tide of sale abroad keeps rising (Chart 4).

Chart 4. U.S. Agricultural Exports

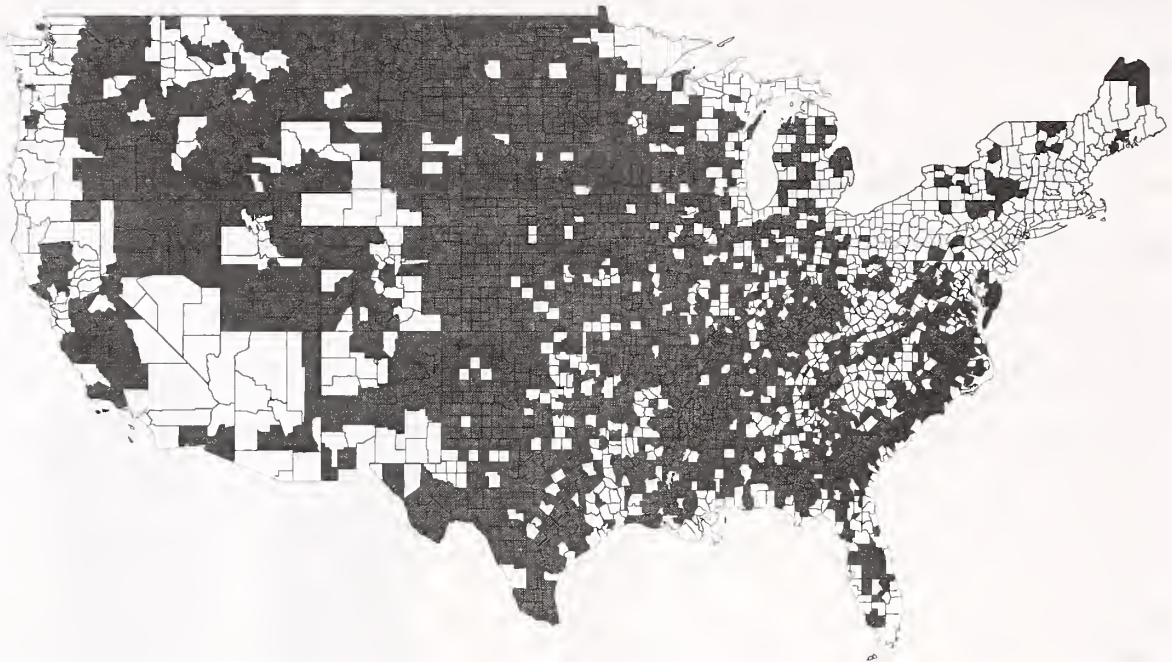
Billion dollars



Fifth, the economic character of rural America has undergone sweeping change in recent decades. Agriculture was once the dominant economic base for most of rural America (Figure 1). The same can simply not be said today. The number of rural counties where agriculture is the primary source of income is a mere fraction of what it was forty years ago. Many rural communities have diversified their economies, in many cases going well beyond agriculture to industries like services and manufacturing. As a result, we need a much broader set of economic indicators than just agricultural ones to track the performance of the rural economy.

Figure 1. Farm-Dependent Counties

1950



In short, several shifts in the agricultural and rural economies suggest that information needs have changed radically from the time when many of the Department of Agriculture's information systems were first put in place. Given the fundamental nature of those changes, a useful first step in designing new information systems is to establish new information priorities.

WHAT ARE THE NEW INFORMATION PRIORITIES?

There are probably many ways to think about new information priorities for 21st century agriculture. Nevertheless, five core needs seem likely to rise to the top of the discussion regardless of one's starting point. Those five are: sector performance, commodity and contract benchmarks, global market developments, retail market outcomes, and rural economic conditions.

Sector performance

As in the past, sector participants and policymakers will both be interested in the overall performance of the agricultural sector. The problem will be defining the "sector." How should the sector be defined as it undergoes an integration process that by its very nature blurs

traditional lines of distinction between producer, processor, and retailer? While a clear-cut definition may be impossible at this stage of the sector's transformation, there is no doubt that structural change will *broaden* that definition.

At a minimum, two current performance measures will need improvement. Better farm income measures will be needed to track the performance of producers *and* value-adding segments beyond the farm gate. Such changes will also force a more realistic line of what constitutes a farm. Today's definition, many would argue, simply includes too many producers who are not viable as commercial enterprises.

Better balance sheet measures will also be needed. Historically, we have viewed a farm balance sheet as resting on farm real estate (typically about three-fourths of total farm sector assets). Yet in the agriculture of tomorrow, real estate may be a much less important asset as producers utilize information to add value to traditional production enterprises. Partnerships and relation-related assets, meanwhile, will be more important and will need to be accounted for.

Commodity and contract benchmarks

This is the information area most people probably associate with the USDA, and it will remain important, although in an altered way. The relevant question, it seems, is this: What information do 21st century "markets" need from the Department of Agriculture? Three types of information seem likely to be important: (1) benchmarks for spot transactions; (2) benchmarks for contract transactions; and (3) benchmark contracts.

The forces of industrialization notwithstanding, commodity production is not likely to fade away anytime soon in 21st century agriculture. There will remain a need for a solid foundation of supply, demand, and inventory information for basic commodities. But the slate of commodities for which such information is needed will be shorter than in the past. In deciding which commodities to keep and which to cut, consideration should be given to the extent to which the commodity has been "industrialized," and the extent to which private sector alternatives for public information are available and at what cost.

Similarly, even as some commodities shift to contract production, producers and processors will still need basic benchmark information for such contracts. For example, more and more corn producers may shift to special use corn grown under contract instead of #2 yellow bulk corn. Even so, the underlying bulk corn market probably will provide useful information in setting contract terms. Again, some care will need to be taken in deciding which underlying commodities will serve as benchmarks for contracts, and thus which commodity information programs need to continue.

An emerging but potentially highly valuable information need relates to benchmark contracts. As more production goes under contract, producers and policymakers may want to know if the terms of the contracts are "fair." Thus, there may be growing demand for sharing contract terms in aggregate fashion through a survey. The question is, who would conduct such a survey? The private sector or the government? There are few answers to these critical questions today. They deserve far more study and debate.

Global market developments

As U.S. agriculture becomes even more integrated into a global market for food and fiber, the need to assess opportunities and risks abroad will rise significantly. The current Asian economic and financial crisis provides an excellent case in point. There is an immediate need to assess the impact of economic turbulence on U.S. exports. There is an equally important need to also evaluate the degree to which long term prospects have changed. In each case, detailed export sales information by commodity and product category and by country is needed.

The implications are plain. There is a growing need for timely, accurate export information. Timeliness will be crucial, as the current Asian situation has shown. In addition, better foreign investment information will be needed. While trade is often the focus, investment is almost certainly going to become a more prominent feature of a global food market where alliances frequently cross borders.

Retail market outcomes

While farm level markets have been the primary focus in the past, attention will steadily shift to the supermarket, in my opinion. The issue will be this: How to track retail market outcomes, especially ones that are of primary concern to consumers? For the near future, at least, consumers are likely to have two primary concerns. First, is the food safe? And second, is a more concentrated food and agricultural sector leading to "unfair" competition and higher food prices?

This issue suggests a considerable shift in attention. Historically, USDA has devoted far more attention to farm markets than retail markets. Yet consumers will probably not be satisfied with limited answers to burning questions. The implications are that USDA will need to provide rules which clearly establish a "food safety trail." And, more and better retail price information will be needed to monitor potential anti-competitive actions.

Rural America

Finally, more information will be needed on the performance of the rural economy. The issue will be, How to track a rural economy which is far more diverse than in the past? Rural America is now something of an "orphan." As it has moved beyond agriculture, there is no longer a clear-cut case for making the U.S. Department of Agriculture its primary agency. Still, there remain many logical reasons why USDA is still a good host for rural economic information. Put simply, it is not clear any other agency is in a position to take on the responsibility.

In the rural economy of the next century, there will be two primary implications for rural information. First, public and private decisionmakers will need more complete and more timely rural economic indicators. Currently, rural employment numbers are available with about a two-year lag--a delay far too long to address many current policy questions. Second, there will be a need for much better information on rural financial markets. These markets are receiving a lot of policy attention in Congress, but information is scant, in part because researchers have historically devoted more attention to agricultural credit markets.

WHAT IS THE USDA'S NICHE IN SUPPLYING INFORMATION?

The most important question, of course, is what niche should the USDA fill in the agriculture of the 21st century? Before drawing some conclusions based on the above discussion, it is useful to take account of what the Department of Agriculture's comparative advantage may be. What does the USDA do uniquely or best?

There are clearly a number of information tasks that belong in the USDA. While this list is not exhaustive, it does illustrate some of the types of information where USDA clearly dominates the field:

- Large surveys, such as farm costs and returns or the food consumption survey;
- Surveys on sensitive issues, such as chemical or pesticide use by farmers;
- Key market benchmarks, such as the World Agricultural Supply and Demand Estimates;
- Synthesis of foreign market developments, such as the Foreign Agricultural Trade of the United States.

In light of its comparative advantages and the new priorities outlined above, what are the conclusions for USDA information programs. First, as agriculture moves to a new industry structure, there will be less overall need for commodity market information. Second, while demand will shrink overall, that does not mean there is no need for commodity information. There remains a great need for commodity *benchmarks*. A major unanswered question is who will provide benchmark contract information. Finally, a broader array of information will be needed on global markets, consumer market, and rural America.

Agriculture's world is changing in dramatic ways. These changes are decreasing the need for some USDA commodity information programs while increasing the need for new programs to provide better information on global markets, consumer outcomes and rural America. To return to my analogy at the outset, the USDA has been writing the book on commodity agriculture, but the industry and policymakers now need a wider web of information. Providing that set will likely require eliminating some of the old chapters on some commodities.

Market Information Needs of the 21st Century, An Industry Perspective

Steve Reed
Sonic Industries

I want to thank the program organizers for inviting me to speak at this session of the USDA Outlook Forum. I was asked to provide an industry perspective of the market information needs of the 21st century, and what the federal role should be in the collection of statistical data, analysis, and dissemination of market information.

Let me answer both questions by telling you what I believe should remain priority data products created by USDA. The resources needed to support these products become my wish list of future market information needs and help define USDA's role in the market place into the next century.

Speaking both in my current capacity as a private sector analyst, and formerly as an economist within USDA's Economic Research Service, I believe the most important data products created by USDA are the World Supply and Demand Estimates (WASDE) and the Domestic and International Baselines.

The WASDE provides unbiased and objective analysis of current supply, demand, and price information for most major agricultural products. The quarterly forecasts included in WASDE are a planning tool for the food and fiber industries in this country and around the world. No private sector organization that I am familiar with provides a similar level of cross-sectional expertise focused on this type of product. A similar cross-sectional team effort results in annual updates of the USDA Baseline Projections, which offer a ten year planning horizon. The Baseline has only recently been released for public consumption, but has been used as an internal working document for many years within the federal government.

Both data products are created and disseminated in an environment that is objective, unbiased and neutral. This alone adds legitimacy to the process and provides a solid foundation for private sector involvement. We are best served by letting the private sector extend the dissemination to a diverse audience that includes an interpretation of how this information may impact each type of enterprise. USDA can not service this type of request. The process of turning "raw analysis" into useful information is a function that the private sector is well suited to.

That does not mean I do not advocate challenges from the private sector on any and all USDA forecasts. That is a healthy and legitimate part of the dialog that all parties benefit from. Whether to accept or reject the information provided by USDA becomes a personal decision each individual or company has to make. What rarely is challenged is USDA's integrity in supplying unbiased information. That has significant value that would be difficult to match with private sector forecasts.

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Book Reviews

Now that I have told you what I think should remain a top priority within USDA, and why I believe no private sector organization can duplicate this effort, let me take the remaining time to highlight my concerns about the future of this program area. Government downsizing, expanded areas of responsibility, and restricted budgets are threatening most USDA agencies. Each Agency is being challenged to defend their program areas and budget expenditures. I am concerned that USDA's commitment to the inter-agency process that results in publishing both the WASDE and the Baseline Projections may be waning. We can not afford to let this happen.

**MARKET INFORMATION NEEDS OF THE 21ST CENTURY:
WHERE DOES THE FEDERAL GOVERNMENT FIT?**

Ewen M. Wilson
Chief, Company Statistics Division, Bureau of the Census

The part that I have been asked to play on this panel is that of a federal government information provider. While the general focus of the panel has been the information needs of United States agriculture, I have been invited to comment on economic statistics in general.

My perspective comes from a background as a data user with a national trade association; an information provider overseeing USDA's economics and statistics programs; and from my current position as head of the Census Bureau's Company Statistics Division. When I joined the Census Bureau nearly four years ago, one of my responsibilities was the Census of Agriculture. Last year that program was moved to USDA, effectively consolidating all federal data on farms and ranches in one place - at the National Agricultural Statistics Service. The Census Bureau continues to collect data from non-farm business establishments that account for 98 percent of the United States economy, including agri-business beyond the farm gate.

The 1997 economic and agriculture censuses are now underway. Conducted every five years these censuses provide the statistical framework to measure economic activity in the United States. This is a massive statistical undertaking eclipsed in size only by the decennial census of population which will next take place in the year 2000.

The population census is what most people associate with the Census Bureau. It is required by the Constitution for apportionment of seats in the United States House of Representatives, and consequently, is subject to unrelenting political scrutiny. It's what you read about in the papers. But economic statistics collected by the Bureau also are subject to intense scrutiny - by the marketplace. In the financial press at least, the latest economic indicators are closely watched, and unexpected numbers move the markets.

The economic census currently being conducted is the bedrock for all statistics that measure the nation's economic performance. It provides the underlying foundation for the national income and product accounts maintained by our sister agency in the Department of Commerce, the Bureau of Economic Analysis (BEA). Quarterly estimates of GDP produced by BEA rely on a series of current surveys designated by OMB as economic indicators. These surveys are like a thermometer reading the current temperature of the economy. But the economic census is needed every five years to calibrate the thermometer and ensure the accuracy of measurement. The census provides a benchmark, without which it would be difficult to have confidence that the current economic indicators are not drifting off-course and causing statistical discrepancy.

The economic census gathers information on 21 million business establishments in the United States. Not all of them get questionnaires. For 16 of the 21 million businesses we simply

extract selected data from administrative records. That cuts the reporting burden on American business enormously. About 5 million establishments - by establishment I mean an individual plant, an individual store, an individual warehouse, an individual service provider - actually received questionnaires last December. These questionnaires range from a short classification form which go to small businesses and take less than 15 minutes to fill out, to detailed long forms which go to a relatively small number of large businesses. The forms are tailored to type of business, so a meat processor and a flour miller get questions that apply only to their businesses. We sent out 475 different versions of the form.

Apart from its sheer size, the most significant feature of the 1997 economic census is that it will adopt an entirely new industry classification system. The new system - the North American Industry Classification System (NAICS) - will replace the Standard Industrial Classification (SIC) system that had been in place since the 1930s. NAICS is designed to account for the enormous changes in the global economy. It reflects the technological revolution we are undergoing, as well as the growth and diversification of services that have marked recent decades. For instance it creates an information sector by grouping together industries that develop, distribute and provide access to information including satellite, cellular and pager communications, on-line services, software and database publishing, along with the more traditional industries like sound recording, motion picture, radio, and television. It recognizes new ways of doing business such as warehouse clubs, pet supply stores, diet and weight reduction centers, and environmental consulting. And it recognizes industries that rely on human capital such as legal, architectural, engineering, interior design and advertising services by combining them in a new professional, scientific and technical services sector. Finally the classification system was developed in conjunction with our major trading partners in this hemisphere - Canada and Mexico - which will enable better comparisons of our economy with that of our NAFTA partners.

Public reaction to NAICS has generally been positive. Data users recognize that the new industry classification system will be more relevant to today's economy. Under the SIC system a large and growing segment of economic activity in this country was lumped in a catch all category, "not elsewhere classified." From a statistical stand point it was an embarrassment that so many new industries could only be described as "other." NAICS will fix that. By adding about 350 new, high-tech, or emerging industries, including greatly expanded coverage of service industries, NAICS gives us an industrial framework that should be relevant well into the next century.

On the other hand there will be breaks in certain data series due to the new groupings of industries. And at the more detailed geographic level it may not be possible to make valid time series comparisons. The Census Bureau will produce bridge tables for all industries at the national level, which will cross tabulate data by both the old and new classification system. And comparative statistics tables will present the new data on an SIC basis at both the national and state level, which will enable data users to compare 1997 results with earlier censuses.

Another significant feature of the 1997 Economic Census is that it will be the first to be published primarily on the Internet. Faced with declining resources the Census Bureau surveyed customers and made a strategic decision to fully embrace the information age. Only highlights of the economic census will be published in paper reports. Detailed data will be available on

CD-ROMs and the Internet. Both CD-ROMs and the Internet will offer "point and click" access to Census data in a "database" format that allow you to download and manipulate data. You will also have access to "viewable" formats that allow you to view or print tables similar to the detailed reports from previous censuses. Our intention is to issue an all new "Advance Report" in early 1999, which will provide a first look at Census results almost a year earlier than data have been available for past censuses.

For those of you who work in the agricultural sector, the economic census provides a comprehensive picture of agri-business beyond the farm gate. It measures the economic activity of food processors, the food distribution system, supermarkets, restaurants and export brokers as well as businesses providing inputs to farms such as tractors, chemicals, seeds and services. I know that many of my former colleagues in the Economic Research Service rely on these data for their work.

I hope this brief overview gives you a flavor of the 1997 economic census. I look forward to the panel discussion.

**Available Navigation and the Incremental Cost of Railroad Capacity:
Preliminary Lessons from the Upper Mississippi Basin**

Mark L. Burton
Visiting Economist
Tennessee Valley Authority¹

Introduction

Good afternoon. As my remarks will make clear, I am not an agricultural expert. I am, instead, a transportation economist who deals regularly with the movement of agricultural and other dry-bulk commodities. Even, however, as a relative outsider, it seems clear that the agricultural community faces an abundance of both opportunities and challenges. Productivity or yield estimates for the coming decades indicate that the American farmer, more than ever, will be able to supply copious volumes of food to domestic markets and to the international community as a whole. On the other hand, many of us have heard compelling arguments that suggest that the ability of American agriculture to compete in international markets will depend heavily, not only on our ability to grow food, but also on our ability to efficiently move agricultural outputs from the field to export destinations. In short, if America is to retain or expand its place in world markets, it must simultaneously improve and expand its transportation infrastructure.

Arriving at this realization is the first and simplest step in the journey toward continued prosperity in the agricultural sector. Moving, beyond this initial awareness, however, toward an adequate assessment of transportation infrastructure capacity, future capacity needs, and the appropriate policy course is a tedious, even torturous, process that requires a great deal of input from a variety of academic and professional disciplines. Moreover, even when the best possible expertise and information are gathered together, uncertainties regarding the magnitude of expected demand and the actual cost of developing new capacity make reliable answers difficult to come by. In short, anyone who claims to know the correct answers is, more than likely, seeking only to further some narrow agenda and is not someone to be trusted. Having offered this warning, I'll spend the remainder of my time today discussing the issues that surround transportation capacity needs. Within this discussion, I'll provide an example of how I and my colleagues are attempting to develop information that will shed at least a little light on a few of these issues, and finally, I will offer a few preliminary conclusions

Future Transport Capacity: Framing the Challenge

The first step in assessing available transportation capacity and determining the best possible way of providing for future transport infrastructure needs is to ask the right questions. The relevant queries actually fall into two broad groupings. The first area of interest revolves around whether or not there is sufficient competition and little enough baggage, so that we may reasonably expect freely operating transportation markets to provide us with the best available outcome. If there is effective competition within and between transport modes and if

informational problems and environmental concerns are satisfied, then the need for aggressive public policy may be minimal. Alternatively, if relevant transport markets are marked by monopoly control or if externalities or other market failures are ignored, then the configuration of the transportation infrastructure that results from unfettered market interactions will almost certainly be undesirable and the public good will be ill-served by a hands-off policy. I've studied the conditions that lead to effective transportation competition at length and have, likewise, worked to integrate environmental concerns into ongoing transport analysis, so that I am convinced that we are making progress in addressing this first set of issues. I am also firm in my belief that the level of transport competition and the determination of the appropriate public response are concerns that demand continual vigilance. This is not, however, the topic of my remarks today.

The second broad area of concern - the one that has motivated the research that I will describe momentarily - is defined by questions regarding the actual physical capacity of existing transportation infrastructures and inquiries regarding the incremental cost of expanding that capacity to meet growing transportation demands. In short, even if questions regarding the adequacy of competition are satisfied, can we build what we need at a cost that will allow us to compete in world markets or will the incremental cost of new capacity lead to increased transport rates and a diminished comparative advantage in world markets? It is a frightening question to ask, but one that demands an answer.

The Incremental Cost of Transportation Capacity

To understand the relationship between incremental capacity costs and currently observed transportation rates, we need only think back to our school days. A "C" student faced with a prospect of a "B" course grade is likely to be pleased with his accomplishment. This is true, in large part, because the inclusion of the incremental grade (course grade) into his overall GPA will produce a new and somewhat higher average. Alternatively, an "A" student who receives the same "B" is likely to be disappointed - not only because her performance was not up to usual levels, but also because the substandard incremental performance will pull down her aggregate GPA. Thus, we see that it is not just the cost of new capacity that matters, but the cost of that new capacity relative to the capacity costs already embodied in transportation rates that really matters. Still, the more cheaply we can place the additional infrastructure needed to accommodate growing demand, the more likely it is that the incremental cost will be less than currently embodied capacity costs, thereby resulting in declining transport rates.

The Upper Mississippi Basin and the Challenge of Measurement

How do we add new capacity as cheaply as possible and will the price tag be low enough? In a sense the U.S. Army Corps of Engineers' complex process for evaluating proposed navigation improvements amounts to an elaborate attempt to defensibly answer the first part of that question. The Corps assesses demand growth, then considers how that growth will impact barge operating costs and observed rates both with the proposed project and without it. In doing so the traditional assumption has been that traffic, diverted from the river, can be placed on the rail network either (1) without the addition of new railroad capacity or (2) with the addition of new capacity that can be brought on line without affecting railroad rates. Thus, the cheapest way

of adding new transportation capacity (and, ultimately the criteria for judging the desirability of navigation projects) depends on whether the incremental cost of adding new navigation capacity is less than or greater than the average capacity cost already embodied in railroad (or trucking) rates.

In many settings the simplifying assumption of constant railroad capacity costs has a benign impact on the ultimate policy decision. Within the context of upper Mississippi River navigation, however, where hundreds of millions of tons of barge traffic could potentially be diverted onto the rail network each year, the assumption of constant railroad capacity costs is, at best, unnerving. Fortunately, the same Corps guidelines that impose the traditional assumption of constant railroad capacity costs also allow for an investigation of the matter if conditions are judged to warrant it. It was the Corps' conclusion that upper Mississippi navigation provides precisely the circumstances under which the validity of the traditional assumption regarding modal capacity must be investigated. The steps to be followed are quite easily enumerated--

Measure the current capacity of the network of line-haul segments and terminals that constitute the nation's rail system.

Measure the incremental capacity that would be needed on the various line-haul segments and at the various terminals if that network were to accommodate the traffic that currently moves on the upper reaches of the Mississippi River.

Measure the least-cost method of producing that incremental railroad capacity.

The devil, of course is in the detail.

Measuring Railroad Capacity

Measuring current railroad capacity requires both a set of facilitating assumptions and a tremendous amount of data that describe the terminal facilities and line-haul route segments which, together, make up the nation's rail system. The most fundamental assumption is that the system - at some point in time - was optimally sized so that it precisely met the needs of shippers. For the purpose of our investigation, that period was judged to be 1994.² Accepting this assumption, the process of measuring capacity and determining the various means through which it can be expanded is relatively straight forward.

In order to measure and assess line-haul capacity, data from a variety of Geographic Information Systems (GIS) coverages were combined with data from other sources to build a set of link-specific information describing the physical characteristics of individual network segments. Next, records from the Surface Transportation Board's Carload Waybill Sample (CWS) were routed over the rail network in order to measure the volume of traffic passing over each network link. Finally, statistical models were developed that relate the observed volume of traffic over a particular route segment to the physical configuration and component quality of that segment. Not only do the models explain the relationship between components, configuration, and segment capacity, they provide a ready vehicle for identifying the various methods through which link capacity can be expanded.

Assessing terminal capacity provides an entirely different set of challenges. No two terminals are the same. Hence, the sort of cross-sectional analysis used to estimate line-haul link capacity is impossible in the case of terminal facilities. Consequently, it is necessary to undertake a painstaking investigation of every terminal at which it can be demonstrated that potential traffic diversions will add appreciable to traffic volumes. These individual analyses must include, but are not limited to: (1) an aggregate assessment of the additional traffic that will pass through the terminal in question; (2) an evaluation of the physical characteristics of the terminal location, including the identification of potential bottlenecks; (3) specific consideration of the individual railroads or combination of railroads that will be required to handle the additional traffic; (4) evaluation of the commodity mix of the additional traffic; and (5) the current potential capacities of both private and publicly owned transload facilities.

Diverting Traffic Onto the Rail Network

Once the rail network is characterized, the next task is to divert traffic from the waterway onto that rail system. Moreover, to ensure the validity of any conclusions it is critical that the diversions be as specific and as accurate as possible. In the case of the upper Mississippi study, this task was made considerably easier by rate and routing information developed as a part of the traditional shippers savings calculations. For each of the 1,331 water movements contained in the shipper savings sample, a rich set of detailed rail, rail/barge, and other land alternatives had already been identified. These alternatives include rate information, so that it is possible to identify the most likely alternative routing based on the economic criteria that would actually guide shipper decisions. It was ultimately assumed that navigation costs would increase to a level sufficient to drive all traffic from the river, so that the full 135 million tons of currently observed upper Mississippi traffic were placed onto the rail network.³

The Cost of Incremental Rail Capacity

Little is more frustrating for an engineer than to encounter an economist with questions about costs. In order to develop cost information that could be applied to broadly to a "typical" route segment, it was necessary to derive rule-of-thumb cost measures that are not influenced by the case-specific physical attributes that engineers typically employ to produce reliable cost estimates. We continually asked, "How much does it cost to add a mile of Centralized Traffic Control (CTC)," or "What is the cost of an additional 1,000 feet of siding." In response, our inquiries were met with questions regarding grade, soil characteristics, watersheds, and the like.

The final cost estimates used in the upper Mississippi analysis do distinguish between projects undertaken in urban versus rural settings and do discriminate between projects that utilize existing right-of-way and those that necessitate right-of-way acquisition. They even make a modest attempt to account for the regional topology that dictates the cost of establishing acceptable grades. Still, it is necessary to emphasize that these are generic cost estimates that should only be applied in circumstances where aggregation will help to mitigate the rule-of-thumb nature of their development.

Preliminary Results: The Upper Mississippi Basin

The formal document that details the methodology and results of the upper Mississippi basin study is currently in its final development in route to internal review by the Corps of Engineers, so that it is not possible to discuss specific results, nor can I guarantee that even the general findings discussed today will survive without modification. Consequently, I would underscore once again that these are my preliminary conclusions based on my interpretation of the empirical results.

The traffic diversions developed for this analysis hold few surprises. Non-grain commodities were constrained to move over their original origin destination pairs, but these movements were allowed to select between an all land routing and a rail barge combination over the Port of St. Louis where such an alternative was deemed feasible. Export grain traffic was allowed one of four diversions that include: (1) the original origin destination pair over an all land routing; (2) a St. Louis rail/barge alternative to the original export destination; (3) an alternative all land routing to a Texas Gulf port; and (4) an alternative all land movement to the Pacific Northwest (PNW).

Of the non-grain traffic roughly one-half diverted to a an all land routing, while the remaining fifty percent diverted to a rail/barge alternative utilizing transload facilities in the St. Louis area.⁴ A significant portion of export grain traffic from northwest Iowa, Northeast Nebraska and from Minnesota diverted to destinations in the PNW, while traffic from southern Nebraska, Kansas, and western Missouri diverted for export over the Texas Gulf. The remainder of the export grain traffic from eastern Iowa, eastern Missouri, and Illinois either diverted to an all land alternative to the original Gulf location or to the St. Louis rail/barge transload alternative.

The majority of affected export grain shipments originate at or near the Mississippi or Illinois Waterway. Moreover, the predicted diversion of all such traffic generally involves a railroad movement to St. Louis (if not beyond). Consequently, it is the line haul trackage between the grain gathering regions in eastern Iowa, northern Missouri, and central Illinois, along with the terminal facilities at St. Louis which pose the greatest capacity concerns.

In order to assess the impact of the additional traffic on line-haul trackage a sample of 15 route segments representing 774 miles of trackage owned by the Burlington Northern-Santa Fe, Norfolk Southern, Union Pacific (including former CNW), and Canadian Pacific rail systems were analyzed. In all but two cases it was found that track capacity could be nearly doubled through signal improvements, siding extensions, or track component upgrades that would increase train speeds. Thus, it appears possible that each of the half-dozen or so routes between the affected grain loading areas and St. Louis could accommodate as much as an additional 10 million tons of revenue traffic each year without requiring the sort of track modifications that that would appreciably increase the cost of providing rail service.

Diverted traffic would impose additional demands on rail terminal facilities at Omaha, Council Bluffs, Lincoln, Kansas City, North Platte, Houston, and a variety of other locations. However, relative to the traffic that already moves over these points, the additional demands would be quite modest. Our analysis suggests that it is only the capacity of the terminal facilities

in the St. Louis area that is of any real concern. The amount of additional rail traffic for the St. Louis area could be significant, amounting, perhaps, to an additional 50 or more unit trains per day. We have developed no information that suggests that Class I carriers would have little difficulty accommodating the additional traffic. However, experts familiar with the area have expressed concern regarding the ability of the two belt or transfer railroads to handle additional interchange or terminating traffic and there is specific concern regarding the capacity of the two railroad bridges spanning the Mississippi which handle the traffic that would necessarily pass between Illinois and Missouri.

Also, the significant amount of grain traffic that is estimated to divert to a rail/barge movement with a transload at St. Louis has raised questions regarding the capacity of the grain handling facilities there. Currently, these facilities handle an amount of grain that is roughly double the volume expected to divert to the rail barge alternative, so that, all else equal, the projected diversions would imply a 50% increase in the magnitude of grain handling activities in the area. Without some alteration of the status quo, this could, in turn, mean a need for expanded grain handling capacity and the additional expense that would imply. It is our judgment, however, that the additional grain rail traffic destined for transload at St. Louis would, in fact, drive shipments that are currently trucked into the area to transload locations further to the south.⁵ Thus, it appears likely that the additional rail traffic would simply replace extant truck traffic without appreciably increasing the total tonnage loaded to barge.

In summary, any policy alternative that significantly increases the costs of navigation on the upper reaches of the Mississippi River would simultaneously force an accelerated expansion of railroad capacity in the region directly above and including St. Louis. It is our judgment, however, that this capacity could be added through modifications to existing infrastructure that would not, by themselves, necessitate an increase in railroad rates. Thus, the Corps' traditional assumption, whereby, railroad capacity costs are assumed to be constant is valid in this instance.

Concluding Remarks

Rail industry advocates who blithely suggest that that Class I carriers currently possess all the capacity they need to accommodate any foreseeable volume of traffic are discredited by the variety of currently observable railroad efforts to expand system capacity both through line-haul trackage modifications and through the reconfiguration, expansion, or simple avoidance of terminal facilities.⁶ There is very little question that, if current trends persist and projections are realized, ever greater expansions in rail capacity will be necessary. The more pertinent questions are whether there will be sufficient competition to produce the market signals needed to bring about the optimal levels of new rail capacity and whether the incremental cost of that new capacity will increase or decrease the cost of providing railroad services.

The research I've described today was designed to provide some evidence regarding the latter of these two questions - at least with respect to the upper Mississippi River basin. Our goal was ambitious, our methods were novel, and our results are, by all means, tentative. Still, it appears, at least in this isolated setting, that those railroads that would be expected to accommodate traffic diverted away from the upper Mississippi River could do so through capacity-enhancing measures that would not add appreciably to railroad costs.

No one, however, should confuse this conclusion with an endorsement of any policy that would lead to such diversions. Quite to the contrary, it is my personal opinion and professional judgment that commercial inland navigation provides (and should continue to provide) a number of critical economic benefits. First, there are myriad movements of innumerable commodities for which barge transportation provides the least costly transport alternative. This is true even when the full range of both private and public costs are taken into account. Thus, the economic savings that result from the utilization of barge transport represent a net welfare gain that would be lost to Americans if commercial navigation is left unsupported. Moreover, there is mounting evidence that the pollution abatement associated with barge transport may play a critical role in our ability to efficiently provide transportation and simultaneously attain ever more stringent air quality standards.⁷ Finally, barge transport provides an important source of competition to rail carriers in a variety of transportation markets. Again, the ultimate desirability of market driven outcomes depends on the presence of effective competition. Without the disciplining presence of a waterborne alternative, we must seriously question whether unregulated competition can survive as an adequate alternative to a policy of more direct governmental oversight

Thank you very much.

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1. While the research described herein was funded by the U.S. Army Corps of Engineers and performed by the Tennessee Valley Authority, the opinions and conclusions contained within these remarks do not necessarily reflect the position of either.
 2. 1994 was the watershed year in which historical rhetoric describing excess railroad capacity gave way to sporadic accounts of capacity constraints. Certainly, in advance of 1994 U.S. railroads were still in the process of "rationalizing" their route systems. Conversely, by 1995 most Class I carriers had expansion efforts at least in the planning stages. If there has been an equilibrium period in the past three decades, it very likely occurred in or around 1994.
 3. The all-or-nothing diversions described above were developed specifically for this analysis and my vary substantially from the incremental traffic diversions predicted by the Corps in its traditional NED analysis.
 4. This includes facilities in Missouri at St. Louis, Jefferson Barracks, and St. Charles, as well as locations in Illinois at Cahokia, East St. Louis, Wood River, Hartford, Granite City, and Alton.
 5. There is already evidence that Paducah is emerging as an alternative transload location for truck shipments bound for barge.
 6. Consider for example, Burlington Northern - Santa Fe's resurrection of the route across the Stampede Pass, UP triple tracking in the Powder River Basin, CSX plans to route traffic around Queensgate Yard in Cincinnati, or the myriad smaller projects evident throughout the United States.
 7. While it has yet to be empirically demonstrated, we believe the pollution abatement advantages offered by commercial navigation will persist even in the wake of the recently announced emission standards for railroad locomotives.

Maintaining the Inland Waterway System for Agricultural Shippers

Gerald W. Barnes

Deputy District Engineer for Programs and Project Management
U.S. Army Corps of Engineers, St. Louis District

Introduction

My name is Gerald Barnes and I am the Deputy District Engineer for Programs and Project Management for the U.S. Army Corps of Engineers at the St. Louis District. I would like to talk today about the condition of the Inland Waterway System, more specifically, the Upper Mississippi River System. As the years have gone by, it has been increasingly evident that work must be done to maintain the current system and to meet the future needs of the system.

Existing Navigation System

The existing navigation system on the Upper Mississippi River was constructed in the 1930's. This system of locks and dams, in conjunction with channel dredging, channel stabilization, and training measures has provided a dependable transportation artery for over 60 years. Maintenance activities associated with the navigation channel continue on the Upper Mississippi River.

There are 29 lock locations (33 locks) on the Upper Mississippi River and 8 locks on the Illinois Waterway. The locks are primarily 600-foot, with 1200-foot locks at locks and dams 19, Melvin Price, and 27. The Upper Mississippi River moved 124 million tons of commodities in 1995. The Illinois Waterway moved 47 million tons of commodities in the same year.

The existing navigation project provides for obtaining and maintaining a minimum channel depth of not less than 9 feet and a minimum channel width of not less than 300 feet at low water, with additional widths in bends.

Waterborne Commerce Statistics for 1997 give you an idea of the commercial navigation volume at the most downstream lock and dam on the Upper Mississippi and Illinois River. There were 2,694 tows which moved through lock and dam 25 located at near Winfield, Missouri. This amounted to 34 million tons of commodities with an estimated value of \$4.0 billion. There were 3,123 tows that moved through the La Grange lock and dam in Illinois. This amounted to approximately 35 million tons of commodities with an estimated value of \$4.2 billion.

As an example, to move the 3,123 tows at La Grange, almost 31,400 barges were required. The average number of barges per tow was 10.1 through the LaGrange Lock. These tows would stretch about 460 miles, or approximately from Minneapolis-St. Paul to below Lock and Dam 18 near Burlington, Iowa. About 350,000 rail cars would line up for approximately 10,000 miles, or coast to coast more than 3 times. About 1.4 million semi-trailer trucks would be needed and would stretch over a distance of approximately 55,000 miles or about 2 times around the world. (Note: an average tow is 105 feet wide and 1,100 feet long - a 3 X 5 configuration.)

The majority of the commodities found on the Upper Mississippi River System are farm- related products. The low transportation cost navigation system for bulk farm goods helps make U.S. farm products competitive in world markets.

Since 1970 total tons on the River have more than doubled. This is also true for Food and Farm Products. Between 1970 and 1980, there was a 59-percent increase in total tons. Between 1980 and 1990 there was a 19-percent increase and between 1990 and 1995 there was a 7-percent increase. The total tons and the tons related to agricultural uses can be found in table 1.

Table 1
Total Food and Farm Products
Minnesota to the Mouth of the Ohio River
(Thousands of Tons)

Year	Total Tons	Food and Farm	AgriChemical(fertilizer)
1970	58,445	20,756	2.144
1980	92,968	51,657	2,962
1990	110,309	57,480	4,067
1995	118,326	56,001	4,671

Source: Waterborne Commerce of the United States, Department of the Army, Corps of Engineers, Water Resources Support Center, WRSC-WCRS-XX-2.

Future Operation and Maintenance Needs

The locks and dams of the Upper Mississippi and Illinois Rivers on average are over 60 years old; that is more than 10 years over their expected useful life. A failure at a lock or dam could require weeks, months, or longer to repair. This would not only have local economic impacts to agriculture, but nation-wide impacts as well. This is why infrastructure rehabilitation of the locks and dams is very important. Major rehabilitation is in progress at three locks and dams in the St. Louis District as you will see in the following examples.

In the St. Louis vicinity at Locks 27 we have completed the main and auxiliary lock portions for new miter gate machinery. The new machinery provides a state-of-the-art hydraulic system for opening and closing the miter gates. Also the electrical system was totally updated as part of a continued operation and maintenance effort.

At Lock and Dam 25 we are just completing a lock de-watering system under a contract for \$3 million. A contract for rehabilitation of the mechanical and electrical systems at both lock and dams 24 and 25 is scheduled at a cost estimated to be approximately 12.5 million. There are very evident signs of deterioration at lock and dam 25. These problems must be addressed under the major rehabilitation program.

At Lock and Dam 24, there are very evident signs of concrete deterioration. The cost of the ongoing rehabilitation will exceed 60 million and require 5-7 years to complete depending on

resources. Also at Lock and Dam 24 a contract is underway to repair bridge columns. In the near future dollars will be spent to replace major mechanical and electrical components, fabricate new lock miter gates, alter miter gate recesses, and construct a downstream protection cell. Another problem we are faced with at Lock and Dam 24 is evidence of cracking damage on the dam piers. The cause of this cracking is believed to be vibration of tainter gates during low water conditions and ice passing during extremely cold winters. These problems will be studied and repaired during a major rehabilitation effort.

Current Studies

Currently there is a study underway which is addressing the future infrastructure needs of the navigation system. As part of the Upper Mississippi River - Illinois Waterway Navigation Study we are currently investigating, along with the Rock Island and St. Paul Districts, the condition of all locks and dams on the Upper Mississippi River. The study will lead to a plan indicating the infrastructure investment required for the next 50 years for the navigation system to continue to function. The study area comprises of all the Illinois Waterway plus that segment of the Mississippi river from the confluence with the Ohio River to Upper St. Anthony Falls Lock in Minneapolis-St. Paul, Minnesota.

This study is examining the feasibility of navigation improvements to these waterways to address the problem of delays to commercial navigation traffic. The feasibility study effort is considering small-scale and large-scale improvements to the river system over a 50-year period (2000-2050). Small-scale measures are less costly items such as guide-wall extensions or nonstructural measures such as scheduling programs or tolls. Large-scale measures are new 1200-foot locks or extension of existing 600-foot locks to the 1200-foot length.

Various disciplines are involved in providing engineering, economic, environmental, and public involvement input to develop existing, future without-project, and future with-project conditions. In addition to the no action alternative, the small-scale and large-scale measures will be combined into various alternative plans for evaluation and ultimately selecting a recommended plan. In addition to the working groups and to aid in the effort, coordinating committees have been established. The Governor's Liaison Committee consists of the Governor's designated representatives of the states involved and the Commander of the Mississippi River Division, U.S. Army Corps of Engineers. In addition to the Governor's Liaison committee, committees were established to aid the technical work groups and to garner external input and to review the technical aspects of the navigation study to help ensure development of a satisfactory product.

Conclusion

There is a need to maintain the inland waterways for future use. The U.S. Army Corps of Engineers has recognized this need and is making efforts to maintain this system. Through the major rehabilitation program, there will be continued investment into the rehabilitation and replacement of system components. As a compliment to this program, the Upper Mississippi River - Illinois Waterway System Navigation Study will look at infrastructure needs for the next 50-years. Much effort must be made to continue to provide services for agricultural shippers and all users of the system.

MEETING THE HIGHWAY AND ROAD SYSTEM DEMANDS OF AGRICULTURE

Paul C. Kerkhoven
Director, Environmental Affairs
American Highway Users Alliance

The Budget proposal President Clinton sent to Congress earlier this month will bring federal spending in line with tax receipts for the first time in 30 years. A task that seemed impossible less than a year ago -- balancing the budget in 1999 -- became considerably easier in January when government economic forecasters projected a fiscal year 1999 deficit of just \$2 billion, little more than a rounding error in a \$1.8 trillion federal budget. The new spending and revenue estimates released by the Congressional Budget Office also project a budget surplus of \$14 billion in 2001 and rising steadily thereafter to \$138 billion in 2008. Those estimates assume no change in federal spending and tax policies.

Many Administration officials, including Agriculture Secretary, Dan Glickman, have spoken about the need for investing in our highways. Yet even with the rosier economic forecasts, the Clinton Administration sets total funding for highways in 1999 at \$23.2 billion, a cut of \$600 million from current levels. The total includes \$21.5 billion for the core highway program, a freeze at FY98's funding levels. In contrast to the funding freeze, highway use taxes deposited in the highway account next year will jump to \$32.2 billion, a \$10.6 billion increase, reflecting Congress' decision to shift all fuel taxes into the Highway Trust Fund (HTF) beginning last October.

The \$9 billion gap between taxes paid by motorists (\$32.2 billion) and funding proposed for highway improvements (\$23.2 billion) serves two major purposes in the Clinton budget. First, the Administration proposes to use some of the highway taxes to subsidize Amtrak out of the Highway HTF for the first time in history. Second, fuel taxes not invested in highways or used to subsidize Amtrak and mass transit would be held in Washington, to help make the budget deficit appear balanced in FY 1999. By withholding highway taxes to offset the federal deficit, the Administration's budget would triple the cash balance in the HTF in just five years, allowing it grow to \$77 billion by 2003.

The bottom line is that highway users would continue to pay billions more each year in the HTF than they get back in road and bridge investments. Their tax dollars would instead be diverted to fund non-highway programs such as Amtrak, and to mask the true size of the federal deficit. Importantly, the outlook for highway users is better on Capitol Hill. Fifty four U.S. senators now have cosponsored an amendment to the Senate Highway bill that would increase highway funding to approximately \$30 billion per year, beginning in FY 1999. In addition, the highway bill already approved by the House Transportation and Infrastructure Committee would raise highway funding to \$32 billion per year beginning in FY 2000.

Begin action immediately on the highway reauthorization bill

Will highway user fees be invested in road and bridge improvements or held in Washington to make the federal budget look balanced? That's the underlying question at issue now as leaders of the United States Senate decide whether to begin action immediately on the highway reauthorization bill or to postpone consideration of the bill until Congress finishes its work on the FY 1999 budget later this spring or summer.

Before Congress adjourned last November, Senate Majority Leader Senator Trent Lott (R-MS) indicated the highway bill would be the first legislation considered when the Senate returned to Washington in January. (ISTEA actually expired last September, and the highway program is operating on a temporary extension.) However, there is now talk of postponing the debate on the highway bill until Congress finishes the 1999 federal budget. This would mean a delay at least until April 20, when Congress returns from a two-week Spring recess. That leaves just two weeks before the May 1 funding deadline, virtually guaranteeing that federal highway funds will be cut off. After May 1, states are prohibited from spending any federal highway funds. Unlike previous delays, this stoppage will occur in the middle of the construction season putting real people, with real jobs, out of work.

Opponents of increased highway funding are pressuring Senator Lott to postpone the highway bill until Congress completes action on the overall federal budget. If that happens, highway funding opponents may convince other senators to use billions of dollars in highway user fees to help cover the overall federal deficit rather than using highway taxes for their intended purpose: financing road and bridge improvements.

The cost to the American farmer will increase

The longer transportation investments are delayed today the more it will cost the American farmer and U.S. economy tomorrow. The efficient and timely movement of farm commodities and the products of the food industry are absolutely critical to the productivity and competitiveness of America's agriculture. Annually throughout the U.S., \$190 billion of farm produced commodities are transported by highway and roughly \$60 billion of farm and food exports are moved to ports and borders by highway, rail and ship. Fifty percent of the agricultural products produced for domestic consumption are transported by truck, while 12% of the products for international markets are transported by truck. American agriculture needs our strong commitment to investment in infrastructure.

The implications to our agricultural community are immense. Every single product sold in the United States moves by truck at some stage of development. Trucks transport almost all fresh and frozen foods and other high value agricultural products. Over 50% of our domestic grain is transported by truck. It is estimated that we have a 16-day supply of food in the United States, one can literally say that without trucks and high quality highways we would all go hungry.

The safety of rural motorists is also at risk

The safety of America's rural motorists is also at risk from under-investment in roads. A FHWA study finds that road design and surface conditions contribute to almost 30% of fatal crashes. This amounts to over 12,000 deaths per year attributable in part to roads that are 1) poorly designed, 2) carrying more traffic than they were built for, or 3) inadequately maintained. We cannot afford to delay lifesaving highway projects. Seventy-six percent of all fatal crashes in 1995 occurred on two-lane roads and 63% of the deaths in roadside hazards occurred on rural roads where there are few safety features such as guardrails, median barriers or shoulders.

International trade

While maintaining existing highways must be America's top priority, some new highways are needed to meet growing travel demand and to serve emerging markets and trade corridors and interior ports. Trade with Canada and Mexico is increasing rapidly under the North American Free Trade Agreement (NAFTA). Some Canadian and Mexican border states have witnessed substantial increases (for example truck freight movement has increased 24 percent from 1994-1996) in international commercial freight traffic exceeding the design capacity of state highway routes that serve as primary trade routes. Increased trade traffic also has placed heavy burdens on trade corridors connecting border locations and other ports of entry with major trade centers in the interior United States. But while NAFTA puts pressure on north-south routes the current Interstate System was primarily designed for east-west trade routes. America remains the world's premier economic power. But our competitors have discovered the economic value of high quality highways and are building aggressively. In order for our nation to promote the efficient movement of goods and services we must continue to build new highways to meet economic and demographic circumstances.

State transportation department activities

The Road Information Program (TRIP) recently surveyed state transportation departments to ascertain what will happen after May 1 if a new highway bill has not been signed into law by that time. Even with preliminary results, it is clear that billions of dollars worth of projects will be postponed until new federal funding is available. These are critical transportation projects — projects designed to improve road safety and reduce the number and severity of highway crashes, to smooth the flow of traffic so we can improve air quality, and to reduce congestion so Americans can spend more time with their families and less time trapped in gridlock.

The following is a partial list of some of the most critical transportation projects that would have to be postponed during the 12-month period beginning May 1, 1998 if no new federal funding is available:

- in **Georgia**, the state transportation department will have to delay improvements to I-475 from I-75 in Bibb County to I-75 in Monroe County; improvements to the Harry S. Truman Parkway in Chatham County; work on the Jefferson Bypass in Jefferson County; and improvements to Peachtree Industrial Boulevard in Gwinnett County.

- the **Indiana** transportation department will have to postpone rehabilitating I-69 in Dekalb County; road and bridge rehabilitation on I-465 in Marion County; and bridge rehabilitation on US 20 in St. Joseph County.
- in **Kentucky**, funding will dry up after May 1 for projects to widen US 27 to four lanes from Lexington to Paris; to reconstruct the Donaldson Road interchange on I-75 in Boone County; and to replace the Cumberland River Bridge in Somerset.
- in **Maine**, delays will occur on the rehabilitation of the Carlton Bridge on US Route 1 in Bath; the reconstruction of four miles of Route 9 in Devereaux; and the replacement of the Penobscot River Bridge on Route 11 in Medway.
- the **Missouri** transportation department will have to postpone the replacement or rehabilitation of seven bridges on I-70 in the St. Louis area; plans to add left turn lanes on Route 61 at Lemay Woods in St. Louis to improve traffic safety; the widening and resurfacing of Route 39 in Barry County; and the replacement of two bridges over the North Fabius River on Route 136 in Scotland County.
- in **Nevada**, they'll have to delay plans to widen I-15 from two to three lanes in West Las Vegas; to remove and replace pavement on I-80 in Reno, and to widen US 95 to four lanes in Las Vegas.
- in **New Hampshire**, our failure to enact a highway bill by May 1 will mean the transportation department has to postpone reconstructing exit 20 on I-93 in Tilton; the safety improvements planned for I-93 in Manchester; and replacing a bridge over North Branch River in Stoddard.
- in **North Dakota**, congressional inaction will mean postponing plans to reconstruct South Washington Street in Grand Forks; to improve I-94 from Eagles Nest to Geck; and to widen US 52 from Drake to Harvey.
- the **Oklahoma** transportation department will have to shelve plans for interchange reconstruction and resurfacing on I-35 in Oklahoma City (a project designed to relieve congestion); a project to widen 50 miles of US 183 from Cordell to Snyder in western Oklahoma to provide four lane access to I-40 (designed to foster economic development in the region); and plans to build shoulders and a passing lane on US 283 in Beckham County to improve highway safety.
- in **South Dakota**, failure to meet the May 1 funding deadline will mean delaying plans to reconstruct I-29 in Minnehaha and Moody County; plans to improve Benson Road in Sioux Falls to provide access to the Joe Ross Field Airport; and a project to improve the interchange at the Haines Avenue exit on I-90 in Rapids City.
- the **Texas** DOT reports that the following projects scheduled for Spring 1999 — all designed to relieve congestion — would be delayed without new federal funding beyond May 1: widening to eight lanes a 4.3 mile section of Route 1960 in Harris County;

widening to eight lanes a 3.9 mile section in Fort Bend County; and widening to four lanes a 6 mile section of US 67 in Johnson County.

- in **Utah**, the following projects — all related to preparations for the 2002 Winter Olympic Games — would be delayed: the reconstruction of the Kimball and Silver Creek Junctions on I-80; the construction of the 1.5 mile Winter Sports Road; and the reconstruction of the interchange at I-84 and US 89.
- in **Vermont**, our inaction will mean delay in the planned resurfacing of 200 miles of state highways; the rehabilitation or replacement of three state highway system bridges and five local highway system bridges; as well as the reconstruction of four miles of US 7 in Shelburne, South Burlington to increase capacity and improve traffic flow.
- in **West Virginia**, the lack of new federal highway funds after May 1 would mean postponing the renovation of the Sheperdstown Bridge on WV 480 in Jefferson County, the widening of a segment of WV 2 in Ohio County to improve traffic flow; and the replacement of the Easley Bridge in Princeton, Mercer County.
- in **Wyoming**, the Senate's failure to act by May 1 would mean delaying reconstruction and bridge work on I-80 in Rock Springs, Rawlins, and Laramie Marginal; as well as widening and rehabilitation projects on I-90 from Buffalo to Gillette and from Moorcroft to Sundance.

Jobs at stake in delay of highway bill

The approaching May 1 deadline is having a disruptive impact on road construction in some states, and the disruptions will grow exponentially if the deadline comes and is surpassed without enactment of a new highway bill. For instance, the state of Missouri has announced it will stop bid-lettings in April, Illinois and Ohio will follow suit on May 1, and the Tennessee Department of Transportation has told contractors that the state will delay all federally-funded highway projects beginning in March. As states announce delays in project bid-lettings, contractors know they will have more difficulty finding work for their employees and making payments on their machinery and facilities.

If new federal highway funds are not available after May 1, much of the summer construction season will be lost. If there is no new highway bill until September, the entire fall construction season will be lost, and since winter road construction is nearly impossible in many of our northern tier states, construction and related industries in those states may be out of work until spring, 1999. Construction does not operate like an assembly line that can be stopped and started again on short notice. The design and construction of highway projects are carefully planned months in advance. Projects to be constructed in September generally must be planned and funded by May.

And if Congress' inaction on the highway bill cripples the construction industry, what effect will it have on the national economy? The last Census of the Construction Industry tallied 572,851 construction companies with a total employment of 4.6 million persons. The industry's annual

estimated payroll is \$118 billion, and construction companies work on projects valued at approximately \$528 billion a year in the United States. Clearly, crippling the construction industry will have a dramatic, ripple effect on our overall economy. The U.S. Department of Transportation has estimated that every one billion dollars invested in highway construction creates 42,100 jobs.

Funding for Highways

The practice of collecting federal fuel taxes exclusively from highway users to pay for the construction, maintenance and administration of highways and bridges dates back to 1956 with the establishment of the Highway Trust Fund. President Eisenhower called it the "pay as you go" plan. With three exceptions, a promise to dedicate fuel tax revenues to roads has accompanied every fuel tax increase since 1956. The last exception was President Clinton's 4.3 cents per gallon fuel tax increase in 1993; \$6.5 billion in highway use taxes went to general government programs like the IRS and funding for the arts.

Last October, Congress, in the Taxpayer Relief Act of 1997, took the long overdue step to shift all fuel taxes into the HTF, and highway use taxes deposited in the highway account next year will jump to \$32.2 billion. The highway reauthorization bill approved by the Senate Environment and Public Works Committee authorizes the use of the federal gas taxes already deposited in the HTF, but does not make use of the Highway Account's share of the 4.3¢ gas tax revenues transferred to the HTF in the Taxpayer Relief Act, in effect allowing for the continued diversion of gas tax revenues for non-transportation spending.

Fifty four U.S. senators now have cosponsored an amendment offered by Senators Byrd, Gramm, Warner and Baucus that would authorize the use of the additional \$6 billion per year, the amount raised by the Highway Account's share of the 4.3¢ gas tax for highway infrastructure. Over the life of the bill, an additional \$30.9 billion would be available for highways if the Byrd, Gramm, Warner, Baucus amendment is adopted. Under the amendment, every state would receive the same percentage of apportioned funds as they receive in the Committee bill, although the total amount of funding would be about 25% higher.

Every President since Lyndon Johnson has withheld highway taxes to offset the federal deficit. Since the HTF became a part of the "unified budget" its cash balance (surplus) has risen 20 fold, from \$1 billion in 1968 to a whopping \$23 billion in 1997. The bill approved by the Senate Environment and Public Works Committee would continue that practice and increase the cash balance in the HTF to over \$60 billion by 2003. The Byrd, Gramm, Warner, Baucus amendment would bring us closer to spending the highway taxes deposited each year in the HTF.

Defining the needs of our nations' infrastructure

Our nations' highways and bridges need every penny collected from our motorists. After years of under investment, America's roads and bridges are in critical need of modernization and repair. Funds available for highways have not kept pace with the meteoric growth in vehicle travel. In its November 1995 "Conditions and Performance Report", the FHWA found that 28% of our nations' 3.9 million miles of streets, roads and freeways are in poor or mediocre condition and

32% of our nations' 575,000 bridges are deficient. The report concluded that the United States must invest an additional \$20 billion each year just to maintain the current condition of our roads and bridges and additional \$40 billion annually to improve them.


Summary

America owes a large measure of its great economic success to a good transportation system. Rail in the first part of the century and highways in the past half century have positioned our nation to assume and maintain global preeminence. On the brink of the 21st century, however, the nation's roadway system is taken for granted and the federal policies governing how it is financed have taken a wrong turn. The system's physical condition is eroding while resources for repairs and improvements are spent for nonhighway purposes or idled in unproductive accounts. The result is a rising number of highway fatalities, productivity-robbing congestion, and a deteriorating highway infrastructure that imperils our economic health and hinders our ability to compete in the global market place. For the agricultural community this is especially important because the efficient and timely movement of farm commodities and the products of the food industry are absolutely critical to the productivity and competitiveness of America's agriculture

I urge all of you to look to the future and tell your Senators to get on with the debate on the highway bill as soon as possible and ensure that all federal highway taxes are devoted to road and bridge improvements. The May 1 deadline is looming and a lot of work lies ahead before Congress can send a bill to the President's desk for his consideration and signature. Congress needs to know that the American agriculture community wants it to act now on a new highway bill.

From Farm to Market

Transportation Serves Rural America

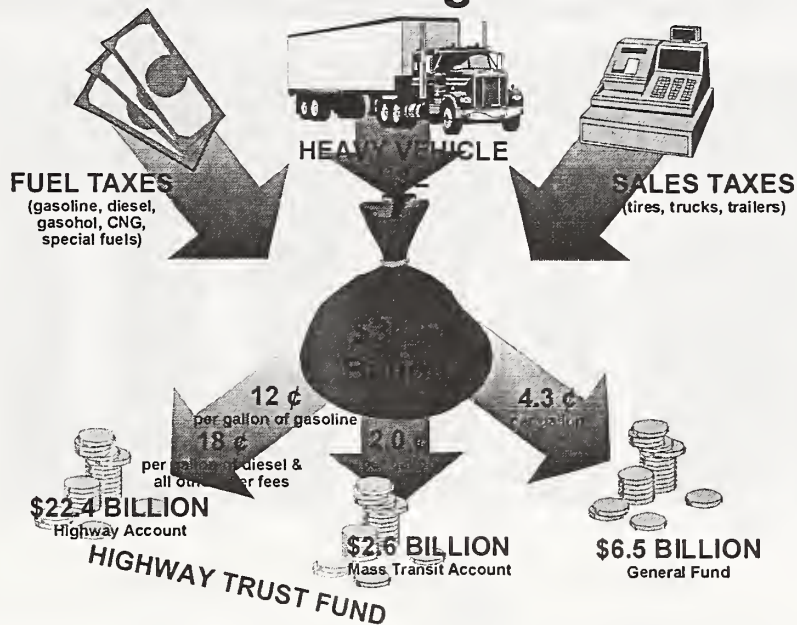


A stylized map of the United States is shown, with various icons representing different sectors of the economy. The icons include a can of beans, a picnic basket, a computer, an oil derrick, and a coat. Arrows connect these icons, symbolizing the flow of goods and services across the country.

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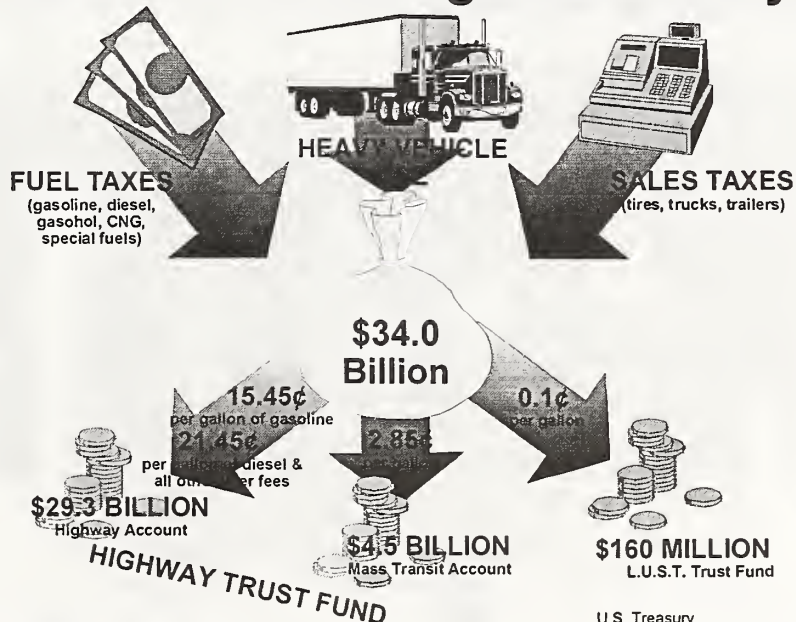
Where the Funding Went -- 1996



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U.S. Treasury

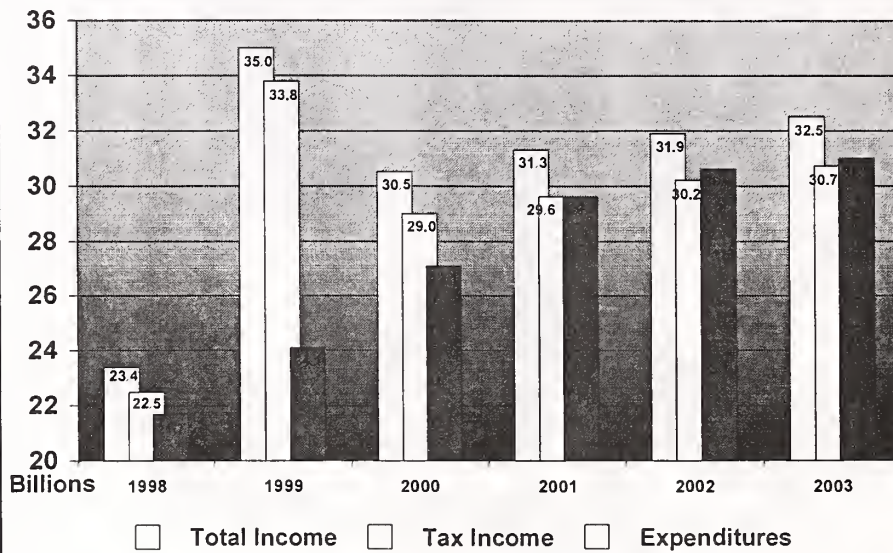
Where the Funding Goes Today



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U.S. Treasury
1998-2003 Average Annual Amounts

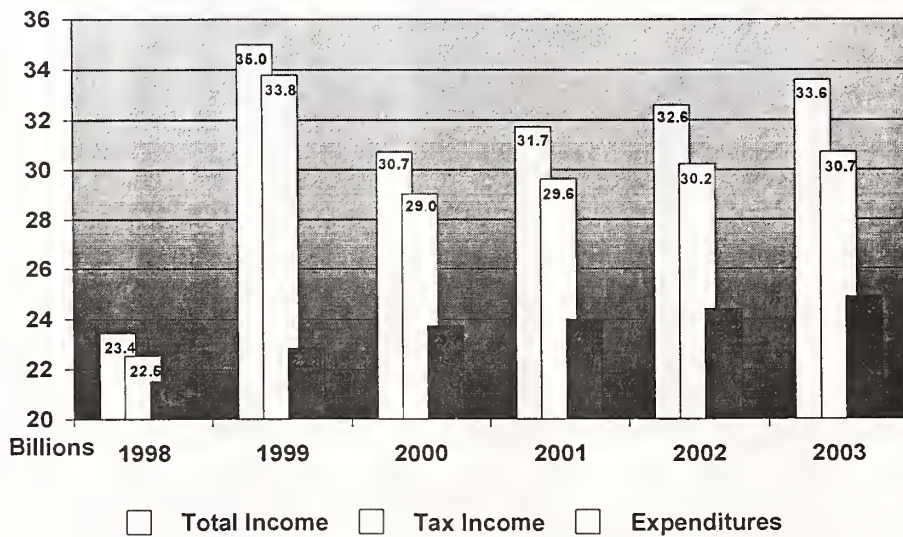
The Highway Account Under BESTEA (H.R. 2400)



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Federal Highway Administration

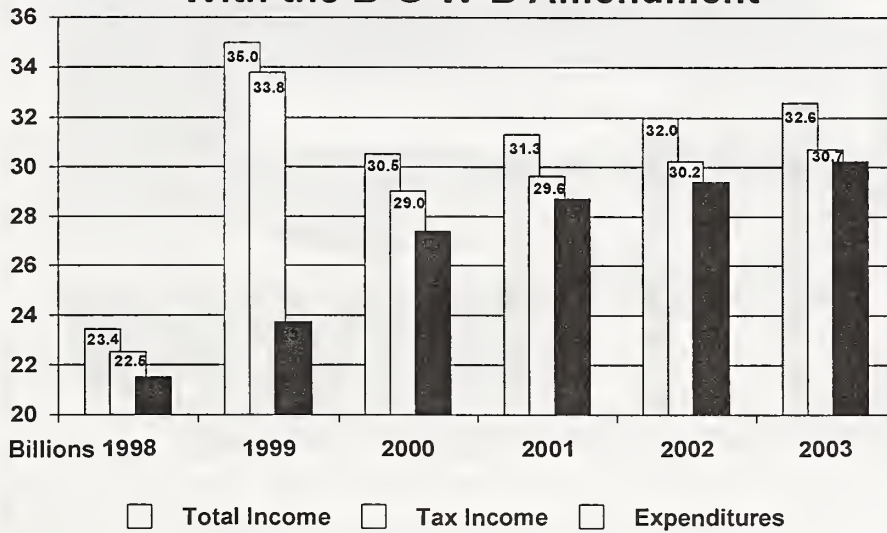
The Highway Account Under ISTEA II (S. 1173)



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Federal Highway Administration

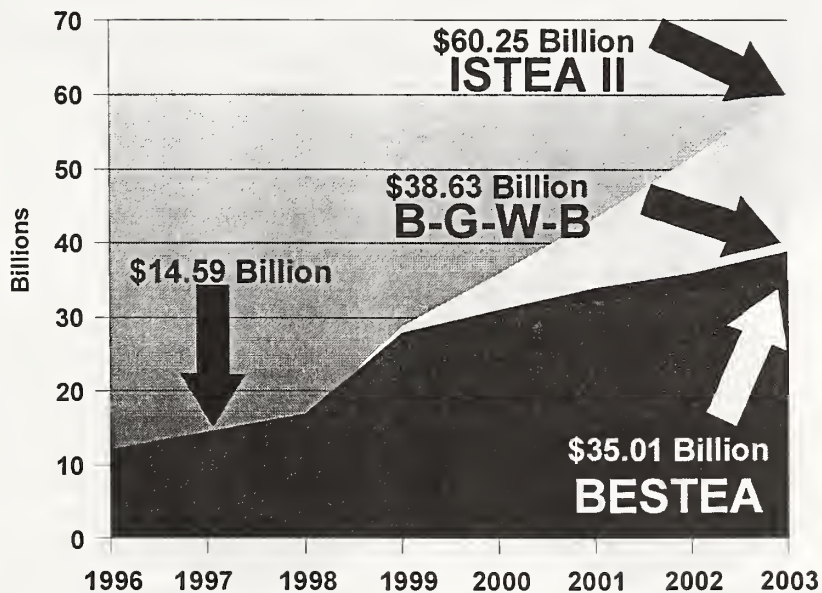
The Highway Account Under ISTEA II With the B-G-W-B Amendment



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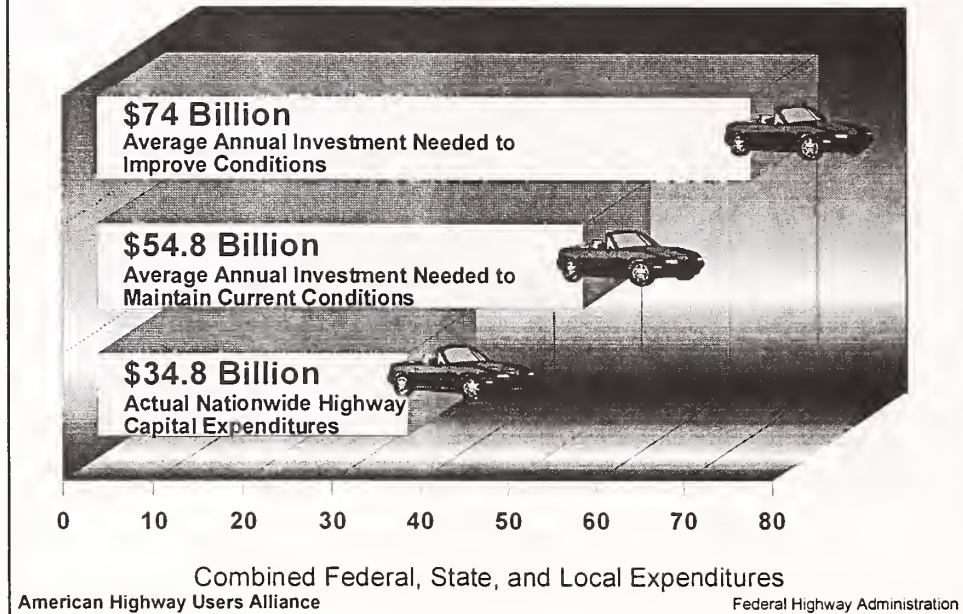
Cash Balance in the Highway Account



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Federal Highway Administration

What's Invested & What's Needed



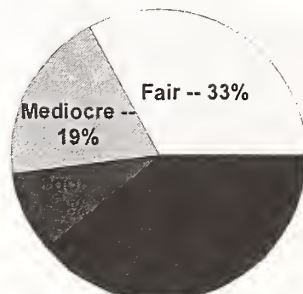
Highways & Bridges Need Repair



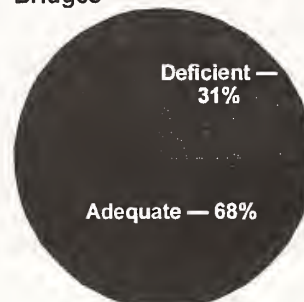
253,629 miles of poor to mediocre pavement
28% of eligible roads

181,748 deficient bridges
31% of bridges over 20 feet in length

Highways



Bridges



American Highway Users Alliance

THE OUTLOOK FOR FOOD PRICES IN 1998

Annette L. Clauson
Agricultural Economist
Economic Research Service, USDA

After increasing 2.6 percent in 1997, the Consumer Price Index (CPI) for food is expected to increase 2 to 3 percent in 1998. If the increase is around 2 percent, it may be the smallest price increase since the early 1990's, when food prices increased 1.2 percent in 1992 and 2.2 percent in 1993.

Although 1998 looks like a good year for lower food prices, there are a couple of factors that may determine if the increase is closer to 2 or 3 percent. The first unknown is whether the sluggish export market for beef, pork, and poultry continues throughout 1998 and the second uncertainty is if the current strong El Nino and unsettled weather patterns continue through spring 1998 in the fresh vegetable growing areas of Florida, California, Arizona, Texas, and Mexico. These two factors could have a major effect on the food at home index in 1998 since the CPI's for beef, pork and poultry account for 20 percent of the food at home CPI, while fruits and vegetables account for an additional 20 percent. Another factor that may skew the individual food category indexes is the re-weighting of all CPI items by the Bureau of Labor Statistics (BLS) this year. After the re-weighting, we are anticipating that the weight for food away from home (currently 36.9 percent) will increase in importance by an additional 1 or 2 percent over food at home (currently 63.1 percent), as a percent of all food.

Retail food price changes are underpinned by general economic factors that influence food prices and the relationship between farm and marketing costs. In recent years, food price increases have been small due to the low general inflation rate, which is forecast to increase 2 to 3 percent in 1998; a larger share of the food dollar going to purchases of food away from home, which has been over 47 percent the past two years; the continued decline in the farm value share of the retail price for most food items, which is expected to average 24 or 25 cents in 1997 and 1998; and increasing economies of size in the farm sector.

Food price changes are also a key variable determining what proportion of income consumers spend for food and what is left for purchases of other goods and services. In 1996, 10.9 percent of household disposable personal income went to pay for food, with 6.7 percent for food at home and 4.2 percent for food away from home. The downward trend in the proportion of household disposable personal income going toward food should continue into 1997 and 1998. Preliminary figures on food sales for 1997, show food at home spending up 2.5 percent and away from home spending up 3.7 percent. After adjusting 1997 food sales for inflation, which provides an indicator of food quantities actually purchased, food at home spending went down 0.1 percent while food away from home spending went up 0.8 percent. With continued competition between grocery stores, restaurants and fast-food establishments, this pattern is expected through 1998.

The food at home CPI increase of 2.5 percent in 1997 was moderated by lower grain prices, large supplies of competing meats, adequate supplies of fresh fruits and vegetables, increased sugar production, and strong competition in the soft drink and prepared food industries. The 1997 CPI increase of 2.8 percent for food away from home, was the largest increase since 1991 and was partly driven by tighter labor markets that have increased general wages. However, competition among restaurants and fast-food establishments remained strong and held down the full pass-through of higher wage and raw materials costs to consumers. An additional pass-through is expected through early 1998.

A discussion of some individual categories of the CPI for food can help explain price changes in 1997 and expected changes in 1998. In summarizing 1997 food price increases, lower grain prices encouraged increases in pork, poultry, milk, and egg production; cereal and bakery product price increases were also smaller because of lower grain prices; plentiful supplies of fruits and vegetables led to smaller retail price increases; and while coffee prices were up for 6 months in 1997, lower prices for carbonated beverages during the same period mitigated the increase for the nonalcoholic beverages index.

- **Meats.** U.S. livestock and poultry prices are under pressure from large meat supplies and reduced prospects for exports in 1998. In addition to large U.S. meat supplies, the currency devaluations in other countries and the need to find alternative meat markets due to economic problems in Asia are making the U.S. a more attractive market for foreign exporters and hurting the U.S. in world competition. As a result, net exports of U.S. red meat are expected to shrink in 1998, further adding to abundant meat supplies competing for the U.S. consumer dollar. As a result, the meat, poultry and fish index, which increased 2.9 percent in 1997 is expected to drop up to 2 percent in 1998.
- **Beef and veal.** Commercial beef production in 1998 is expected to fall 1 to 2 percent, from 1997 levels. The Asian financial crisis and the strong U.S. dollar are expected to lead to lower beef exports and rising imports, as the U.S. becomes a lucrative market due to the strength of the dollar. U.S. beef exports are likely to decline almost 7 percent in 1998, as declining sales to the Pacific Rim overwhelm any increased sales to Mexico. After increasing a modest 1.7 percent in 1997, the CPI for beef and veal is expected to increase at about the same rate in 1998, from 0 to 2 percent, as large supplies of competing meats and a less than robust international trade scenario hold down price increases in 1998, until at least late summer.
- **Pork.** With expectations of plentiful supplies of pork and competing meats throughout 1998, pork retail prices are expected to fall 4 to 6 percent, after increasing 5.2 percent in 1997. Forecast of a 9 percent increase in pork production in 1998 should lead to the largest per capita consumption rate since 1994, increasing 5 pounds from 1997 levels to almost 70 pounds per person. U.S. pork exports in 1998 are expected to be 990 million pounds, off 10 percent from previous estimates because of expected reductions in Asian demand. In particular, U.S. exports to Japan are expected to be down in 1998, due to losses in market share to lower priced Korean pork products and a stronger U.S. dollar.

- **Other meats** increased 2.8 percent in 1997, and in 1998 prices are expected to remain flat, from -1 to 1 percent. Other meats are highly processed food items (hot dogs, bologna, sausages) with their price changes influenced by the general inflation rate as well as the cost of the meat inputs.
- **Poultry.** Broiler meat production for 1998 is expected to be almost 29 billion pounds, up 5 to 6 percent from 1997. However, 1998 turkey production is expected to be unchanged from 1997, as weak net returns in 1996 and 1997 put pressure on turkey producers to hold down production levels. During the past several months, export prospects for U.S. poultry have become less certain due to the continuing financial crisis in many Asian countries; depreciated currencies in Thailand and Brazil, which give them a price advantage over the U.S. in many major markets; and the outbreak of Avian influenza in Hong Kong, which was the second largest market for U.S. broilers and turkeys. As these factors continue into 1998, production increases will likely slow down, with the CPI for poultry expected to be between -1 and 1 percent, after increasing 2.8 percent in 1997.
- **Fish and seafood.** The CPI for fish and seafood was up 2.3 percent in 1997, with an expected 1 to 3 percent increase in 1998. Almost 50 percent of the fish and seafood consumed in the U.S. comes from imports, with the remaining amount from U.S. farm raised production. Imports for 1997 were up--salmon, shrimp, crawfish, mussels, tilapia, and oysters. Domestic production of catfish and trout was also up, with the U.S. having one of the world's largest fishing industries with year-round production. In the 1990's, U.S. per capita seafood consumption has remained flat, between 14.8 and 15.2 pounds of edible meat per year, with any increases in total domestic seafood consumption coming from population growth.
- **Eggs.** After volatile egg prices in 1996 and a CPI increase of 18.0 percent, higher production and lower export levels during 1997 led to larger U.S. consumption of eggs and lower average retail prices. With table egg production expected to be about 2 percent higher in 1998, consumption is expected to increase again, to the highest level since 1988. Because of the higher production level in 1997, the CPI for eggs fell 1.5 percent, but is not expected to increase this year, averaging between -1 and 1 percent in 1998.
- **Dairy products.** Milk production in 1997 increased about 1 percent from 1996 levels, because of increased demand and lower feed costs. Increased production led to large U.S. commercial dairy stocks, particularly of nonfat dry milk and American cheese. These factors, along with a modest dairy product demand, led to a 2.4 percent CPI increase in 1997. With milk output expected to increase slightly this year, retail prices for dairy products are forecast to increase from 0 to 2 percent in 1998.
- **Fats and oils** increased 0.9 percent in 1997 and are expected to increase a modest 1 to 3 percent in 1998. Since fats and oils are highly processed food items, their price change is influenced by the general inflation rate in addition to U.S. and world supplies of vegetable oils. Soybean oil is the primary oil used in the production of vegetable oil products, however the relationship between soybeans and the retail price of vegetable oils is

complex. Soybean oil is a joint product with soybean meal, which is primarily used for animal feed.

- **Fresh fruits.** Total fruit-bearing acreage has increased steadily for the past 5 years. Citrus fruit acreage has expanded because of re-plantings in Florida, after a freeze in the late eighties, that have begun to bear fruit. These trees, which include oranges and grapefruit, will be producing increasingly larger crops into the early 2000's. California has also expanded its orange production areas with most of their crop going for fresh use, while the majority of Florida's oranges are used for juice.

Summer fruits were also in abundant supplies in 1997, bringing about generally lower prices and expanded export opportunities for the U.S. fruit industry. California, the largest producer of peaches in the U.S., produced another large crop in 1997. Supplies of nectarines, plums, apricots, and sweet cherries were also abundant in 1997. Apple production was down about 2 percent in 1997, due to a smaller Washington crop and smaller fruit size in North Carolina and Virginia. Banana supplies, which are all imported, were sufficient to meet demand the past two years with retail prices averaging 49 cents per pound in both 1996 and 1997. The fresh fruit index increased a modest 0.8 percent in 1997, and is expected to increase 2 to 4 percent in 1998 due to continued U.S. consumer demand and projected larger exports.

- **Fresh vegetables.** The weather and growing conditions in the major fresh vegetable growing areas were mixed in 1997. A January freeze in Florida did minimum damage to several fresh market vegetables--squash, snap beans, green peppers, eggplant and tomatoes, with the impact on retail prices for these items less than originally expected. Fresh-market vegetables grown in other states and not affected by the freeze were--potatoes, lettuce, onions, celery, broccoli, cauliflower, and cabbage.

Growing conditions normalized during the spring and summer months, but then weather conditions changed again the last quarter of 1997. Torrential rains in Florida, rain and cold in the desert areas of California, Arizona, Texas, and an unusual December freeze in West Mexico led to lower supplies and higher retail prices for tomatoes, bell peppers, lettuce, and broccoli. In addition to the weather-related growing problems, retail prices for some fresh market vegetables and potatoes were higher in Fall 1997 because U.S. growers reduced harvested area from a year ago. On an annual basis, fresh vegetable prices increased 2.9 percent in 1997 and are expected to increase 3 to 5 percent in 1998. The size of the 1998 price increase depends on the continuation of unsettled weather patterns due to a strong El Nino through Spring 1998, changes in planting intentions, and expected higher prices for potatoes (the most heavily weighted item in the vegetable CPI).

- **Processed fruits and vegetables.** Contract acreage for the five leading processing vegetables (tomatoes, sweet corn, snap beans, green peas, and cucumbers) was down 3 percent in 1997, after a 9 percent decline in planted acreage a year earlier. However, processed vegetable prices increased a modest 2.3 percent in 1997 and are expected to increase 1 to 3 percent in 1998. The ready availability of fruit supplies also kept the CPI

increase for processed fruits to 2.5 percent in 1997, with an expected increase of 0 to 2 percent in 1998.

- **Sugar and sweets.** Domestic sugar production was up to 7.2 million tons in 1996/97 and is projected up another 9 percent in 1997/98. Higher sugarbeet prices and lower prices for competing crops led to acreage increases in both years. Along with higher sugar output, lower retail prices for selected sugar-related food items in 1997 increased the sugar and sweets CPI by 2.9 percent. Although U.S. sugar consumption has grown at a rate of about 1.9 percent per year since 1985/86 and sugar use by industrial users has risen, the CPI is projected to increase a moderate 1 to 3 percent in 1998.
- **Cereal and bakery products** account for a large portion of the at home food CPI - almost 15 percent. While higher grain prices contributed to higher retail prices for selected bakery products in 1996, lower grain prices in 1997 held the increase to 2.1 percent. Most of the costs to produce cereal and bread products are for processing and marketing, more than 90 percent in most cases, leaving the farm ingredients a minor cost consideration. Competition for market share among the three leading breakfast cereal manufacturers led to the cereal component of this index falling 9.7 percent from 1995 to 1996, with an additional decrease of 1.4 percent from 1996 to 1997. With demand for cereal and bakery products as well as competition among producers expected to continue, the CPI for cereals and bakery products is expected to rise at a rate of 1 to 3 percent in 1998.
- **Nonalcoholic beverages.** Coffee and carbonated beverages are the two major components, accounting for 32 and 50 percent of the nonalcoholic beverages index. After falling 2.4 percent in 1996, due to lower coffee prices, the index increased 3.7 percent in 1997, due to higher coffee prices. Although coffee prices were up 12.6 percent in 1997, the increase in the nonalcoholic beverages index was mitigated by a drop of 1.4 percent in carbonated beverages. Competition in the soft drink industry by the two major competitors peaked during the summer months and continued through the end of 1997, leading to the reduction in the carbonated beverages index.

Speculation about a smaller 1997/98 coffee crop in Brazil (the largest Arabica coffee producer) and an uncertain labor situation in Colombia were responsible for the sharp increases in green coffee costs on the world market in spring and summer 1997. These price increases combined with low U.S. coffee stocks produced wholesale price fluctuations that led to higher retail prices for 6 months of the year. Fortunately, prices of Robusta coffee beans, the primary ingredient in retail store coffee blends did not increase as sharply as Arabica prices. Since the CPI for coffee reflects only coffee purchased in retail stores, smaller increases in Robusta prices along with the drop in the carbonated beverages index held down what might have been a larger increase in the nonalcoholic beverages price index in 1997. With coffee prices continuing to decline, the CPI for nonalcoholic beverages is expected to increase 1 to 3 percent.

- **Other prepared foods.** Other miscellaneous prepared foods are highly processed and are largely affected by changes in the all-items CPI. These products include frozen dinners,

pizzas, and precooked frozen meats. Competition among these products and from the away from home market should continue to dampen retail price increases for items in this category. In 1997, the CPI for this category increased 3.2 percent and is expected to increase 2 to 4 percent in 1998.

**Changes in Food Price Indicators
1996 through 1998**

Items	Relative importance ^{1/}	1996	Final 1997	Forecast 1998
	--Percent--		-----Percent Change-----	
All Food	100.0	3.3	2.6	2 to 3
Food Away From Home	37.3	2.5	2.8	2 to 3
Food at Home	62.7	3.7	2.5	1 to 3
Meats	12.2	3.5	3.0	-2 to 0
Beef and Veal	6.2	-0.3	1.7	0 to 2
Pork	3.4	9.8	5.2	-6 to -4
Other Meats	2.5	3.6	2.8	-1 to 1
Poultry	2.7	6.2	2.8	-1 to 1
Fish and Seafood	2.4	0.9	2.3	1 to 3
Eggs	1.0	18.0	-1.5	-1 to 1
Dairy Products	7.4	7.0	2.4	0 to 2
Fats and Oils	1.6	2.4	0.9	1 to 3
Fruits and Vegetables	12.7	3.5	2.0	2 to 4
Fresh Fruits and Vegetables	8.9	2.8	1.7	3 to 5
Fresh Fruits	4.5	7.1	0.8	2 to 4
Fresh Vegetables	4.5	-2.0	2.9	3 to 5
Processed Fruits and Vegetables	3.8	5.0	2.4	1 to 3
Processed Fruits	2.1	5.8	2.5	0 to 2
Processed Vegetables	1.6	4.0	2.3	1 to 3
Sugar and Sweets	2.1	4.5	2.9	1 to 3
Cereals and Bakery Products	9.2	3.9	2.1	1 to 3
Nonalcoholic Beverages	5.0	-2.4	3.7	1 to 3
Other Prepared Foods	6.5	3.4	3.2	2 to 4

^{1/} BLS estimated expenditure shares.

Consumer Interests in Vertical Coordination in the Pork and Broiler Industries

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Introduction

The pork industry is currently undergoing a period of rapid structural changes, commonly referred to as the *industrialization of the pork industry*. Although its roots are embedded in the early 1980's, changes have accelerated in the 1990's. New technology is creating scale economies, geographical shifts in production are occurring, and the larger production and packing operations are turning to multi-year contractual arrangements and, to a lesser extent, vertical integration.

Moves from open market coordination via spot prices to contracting and integration may limit the ability of smaller independent producers to compete. These *non-spot coordinating arrangements* may create barriers to entry by reducing the number of available market outlets. Independent producers may be subject to price discrimination when the terms of contracts are not made publicly available. Market power through price discrimination or barriers to entry may result in misallocated resources.

On the other hand, these arrangements may also serve legitimate economic functions that benefit consumers. Consumer interests in how the food marketing system is organized is examined in this paper by comparing past developments in contracting and integration in the broiler industry with current changes in the pork industry.

Lessons From the Broiler Industry

The broiler industry began in the 1930's. About 65 million pounds of chicken were produced in 1934, about the equivalent of one day's output in 1991 (Hyk). By 1940, U.S. production increased threefold with Delmarva's (Delaware, Maryland, Virginia) share rising from 32 percent in 1934 to 43 percent in 1940. During World War II, demand for poultry products increased. At this time, it became apparent that broilers could provide a profitable business opportunity. After the war, many new production technologies were developed at a rapid pace. Yet, the manner in which the industry was organized at the time was not conducive to the adoption of available technology. Spot prices in open markets served to coordinate the flow of resources in the broiler marketing system. Broiler growers purchased chicks from hatcheries and feed from feed dealers. When ready for market, the growers would sell the birds through open markets to processors.

Contractual arrangements between feed suppliers and growers became increasingly popular. Initially, under these arrangements feed suppliers would extend credit to growers with limited

financial resources for buildings, equipment, and feed. In turn, feed dealers assured themselves of a potentially large market for their feed supplies. As price and production risk became more problematic for growers, in addition to greater needs for financing, *production contracts* evolved to shift more risk and management responsibilities to the feed suppliers. Additional areas of broiler production began in the South, in part, due to the South's declining cotton industry and their willingness to adopt contractual arrangements (Roy). By 1955, most broilers were produced using production contracts.

In the 1950's and 1960's, feed suppliers added hatcheries and processing facilities, and were referred to as *integrators*.¹ Later, processors assumed the role of integrator, as feed companies left the broiler business to focus on their feed business.

Consumers were the prime beneficiaries of these developments in the broiler industry. Technological gains and structural reorganization of the broiler industry facilitated rapid growth in production. Consequently, broiler prices continued to fall. Following World War II, the emergence of mass merchandising through supermarkets, provided an outlet for large broiler supplies. Broilers could be offered as a "price item" to attract customers into the store. Retailers, as well as consumers, found fresh, eviscerated broilers to be convenient because they required less handling by the butchers. Unlike red meat cuts, there was less concern about how fast various cuts sold because the bird was sold as whole or packaged parts.

As broiler production continued to increase, further reductions in price, and improved responsiveness to consumer preferences contributed to further increases in per capita consumption of broilers. The value of consumers' time increased, household size became smaller, and information linking diet and health became more prevalent. Consequently, consumer preferences for convenient, nutritious food products with assurances of quality became more important (Kinsey). Broiler integrators looked to further processed products, fast food outlets, and branding as ways to market their products, in response to the broiler glut. As a result, the percentage of broilers sold as whole declined. Broilers have increasingly been sold as cut-up parts and further processed into products such as nuggets and patties. Because integrators have greater control over the production process, standardization of production inputs enable them to establish brand names. Because a company is associated with the branded product, it's reputation hinges on the quality and uniformity of the product.

The domestic market is not the only market that has benefitted from efficiency gains in the U.S. broiler industry. Much of the recent increase in exports were accounted for by Russia and China, which have moved toward more liberalized markets.

¹Substantial production growth and price instability contributed to numerous mergers and exits from the industry. In addition, the Poultry Inspections Act of 1957, required mandatory processing plant inspections, which led many processors to update their facilities and add capacity in a short time span. To capture scale economies, the plants had to run. Processors could assure themselves of an adequate supply of broilers through mergers or contracting. This contributed to the demise of the open market for broilers, and further reductions in the number of independent producers and processors (Tobin and Arthur).

Industrialization of the Pork Industry

Although more subtle, there are similar developments occurring in the pork industry. Health enhancing, cost reducing technologies have created scale economies for large production operations. At the same time, hog production is reorganizing to facilitate more rapid growth in size. Whereas production historically occurred at a single site, production has shifted to more specialized operations, where farrowing, nursing, and finishing are conducted at three separate sites. Production contracts between large producers, commonly referred to as contractors or integrators, and smaller growers shift price and output risk from the growers to the integrators. Because growers invest in buildings and equipment, the integrators can invest in other areas of production to rapidly expand their operations. At the same time, packing plant capacity is on the rise. *Marketing contracts* are increasingly used by the large producer-integrators to sell hogs to the large packers. Survey results suggest that these arrangements are used to obtain a consistent, large supply of high quality hogs, and assure a market outlet for large hog supplies (USDA).

Hog production and slaughter capacity has been shifting from the Midwest to the Southeast, led by North Carolina, and other areas to a lesser extent. The decline of the tobacco industry, familiarity with poultry contracting, and lower labor and building costs are commonly cited reasons for expansion in the Southeast.

Efficiency gains in the pork industry are indicated by the number of pigs weaned per litter and the quantity of pork obtained from a given inventory of hogs. The number of pigs weaned per litter reached 8.65 in 1997, up 11 percent from 7.77 in 1987. Productivity gains have enabled hog producers to produce the same quantity of pork as in 1980, the peak year for hog production, with a 20 percent smaller breeding inventory (Benjamin). While productivity gains have contributed to increases in production and reductions in the real price of pork over the past ten years, added production has been exported or used to feed a growing U.S. population. While 1998 per capita consumption is expected to increase by 5 pounds, or 8 percent from 1997, per capita consumption of pork has remained fairly stable over the past ten years.

Future Growth of the Pork Industry

In the broiler industry, while supplies grew rapidly and prices continued to slip, developments further down the chain played an important role in it's continual growth. Mass merchandising through supermarkets provided an ideal outlet for large broiler supplies. Later, the industry targeted consumer preferences for quality assurance and convenience through branding and further processing. Hence, price reductions and response to consumer preferences led to further increases in per capita consumption. Moves to contracting and integration appeared to serve an important economic function that facilitated the adoption of technology. Ultimately, these new methods of coordination provided a means to gain control of the production process to enable branding and new product development. Evidence exists suggesting that, since the 1980's, consumer demand for chicken may have increased. Although the exact cause is difficult to pinpoint, it is likely a combination of changing consumer tastes and preferences (for example, health interests and dietary fat concerns), changing relative prices of substitute meats, and higher

incomes as premium parts and more value-added products were purchased (Rogers).

Despite growth in pork supplies and reductions in the real price of pork, per capita pork consumption has remained stable over the last ten years. Hence, future growth of the pork industry may hinge on its ability to respond to consumer preferences for quality, quality assurances, and new product development. A 1992 survey of major packing plants suggested that there is considerable room for improvements in pork quality (National Pork Producers Council). It was estimated that quality problems cost packers \$10.08 per hog. Of this amount, \$8.15 was found to be controlled by hog producers. This suggests that increased coordination between producers and packers to improve quality could result in cost savings. In a competitive marketing system, such quality improvements would benefit consumers through lower retail prices and higher quality products (Martinez, Smith, and Zering).

Apparently, packers are turning to multi-year marketing contracts to obtain the quality, consistency, and quantity of hogs for slaughter, as it becomes more costly to obtain hogs on the open market. We may see even more rapid moves to contracting, and perhaps vertical integration, as firms attempt to gain greater control over pork quality. By specifying premiums for higher quality hogs, multi-year contracts may serve to increase the quality of hogs obtained.²

There are, however, important differences between moves to contracting and integration in the broiler industry and current developments in the pork industry. The broiler industry represented a new industry with limited institutional constraints. Growth of the industry was facilitated by the use of contracts and integrated operations. The pork industry is an established industry, still coordinated by spot prices in open markets, for the most part. Hence, moves to contracting and integration are substituting for an established open market, coordinated by spot prices. Contracting and integration, coupled with larger operations, bring concerns related to market competitiveness.

There appears to be growing institutional constraints that may affect future structural change in the pork industry. Consumers are becoming increasingly concerned about the effect that their own consumption choices and those of others have on the environment (Kinsey). As evidenced by the recent moratorium placed on pork production operations in North Carolina, environmental concerns may limit future growth. In fact, the poultry industry has also been recognized recently for possible water pollution problems. While technology may be able to lessen environmental risks, it is unclear whether such technology might accelerate consolidation of hog production.

The challenge for policymakers is to better understand the short and long run benefits and costs of contracting and vertical integration in more concentrated markets. In addition, by better understanding the reasons for contracting and integration, public policy decisions affecting the viability of open markets can be better formulated.

²USDA found that half of all multi-year marketing contracts included quality specifications.

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SUPERMARKET TRENDS AND CHANGES IN RETAIL FOOD DELIVERY

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The supermarket, one of several types of retail food stores, is the last stop for a farm commodity before a consumer selects it. That commodity has been transformed into a (nearly) ready-to-eat food or beverage and shipped through a complex distribution system in response to an order from the manager of a retail food establishment. This manager is the first to observe what consumers are willing to pay and what they desire to eat. The role of the retail outlet in the food distribution chain has evolved from a relatively passive handler of national brands and seasonal products to an active advocate for consumers' preferences. Today the food retail outlet can be thought of as the command center of the food system. Here, data is gathered about what sells. This data is released into the food distribution chain where it signals an order for more (or less) of particular products needed to replenish shelves. These signals are, in turn, relayed up stream through processors to farmers where they make adjustments in crops, livestock, seed types, veterinary services and financing in order to respond to the demand for particular varieties, quantities and qualities of food.

Many factors have induced a shift from "production push" to "retail pull" in the food system not the least of which is an increase in consumers' preference for a wide variety of safe and convenient food. This paper discusses the size, operation and role of retail grocery stores in the food system. The implications for agriculture are many. They include the increased use of vertical coordination and contract relationships up and down the food distribution chain.

The Food and Agricultural Industry - Size and Trends

Food and agriculture is one of the largest industries in the U.S. economy making up 13.4 percent of the Gross Domestic Product (GDP). Retail food sales make up 7.2 percent of GDP, more than any other retail sector including automobiles. This sector employs over 15 percent of all workers with over 12 percent working at the retail end. Grocery stores capture about 53 percent of the food dollars spent while providing over 70 percent of the food (by weight) eaten in the United States.

There are 127,000 grocery stores in the United States; 10 percent fewer than 5 years ago. The top 100 retail food companies (measured by total sales) own or service almost 17 percent of all these stores compared to 12 percent five years ago (Chain Store Guide). One-third of the \$425.7 billion sales made in grocery stores in 1997 were made in stores affiliated with the top ten supermarket chains (Chain Store Guide, FMI, 1997a). The top four chains, Kroger, Safeway, Albertson's, and American Stores captured 17 percent of total grocery sales. These four chains have been among the top 5 grocery companies since 1976.

Continuous mergers (averaging 54 per year over the last ten years) and on going divestitures (averaging 35 per year) keep this end of the food distribution chain competitive and dynamic (USDA). Economies of size, distribution and management fosters continuing consolidation on a regional basis, but food, like politics, is a local business. Real competition is considered to be within three miles of one's store. Looking at market share in the 100 largest metropolitan areas in the U.S. reveals that in 18 metro areas one chain has captured more than 40 percent of the market share but in none of the areas covered were there fewer than nine chains to choose from (Chain Store Guide).

The percent of total market shared by the four largest chains is a standard measure of concentration in an industry. Among these 100 metropolitan areas 24 had concentration ratios of over 80 percent including 4 areas that were over 90 percent. Almost half had concentration ratios between 66 and 80 percent (Chain Store Guide). Economists have worried about whether concentration would lead to higher food prices; evidence on this is very mixed (Cotterill).

We can expect continued buyouts and mergers and reorganizations. Supermarkets are getting bigger, with median store size now over 38,000 square feet. Club stores and supercenters have between 100,000 and 200,000 square feet with at least 40 percent of it devoted to groceries. Sales per square foot is a standard performance measure and it has increased, on average, from \$392 to \$409 over the past 5 years. As stores get larger and add more high service departments, this figure fluctuates across chains. The range of sales per square foot was between \$1,026 and \$180 in 1996 with the higher figures tending to be aligned with stores that sell higher priced products (Chain Store Guide).

The formats of grocery stores has changed dramatically. A supermarket is generically defined as a full line grocery store with sales of over \$2.5 million per year. A conventional supermarket is defined as a store that devotes most of its space to a full line of food and beverage products including fresh meats and produce. This type of store format is declining in numbers. The large growth has been in supercenters, superstores and combination stores where up to 60 percent of floor space may be devoted to nonfood merchandise. Convenience stores are also a fast growing format.

The definition of store formats varies by author. One distribution of the number of stores by format shows that convenience stores comprise 44 percent of all the store units, combination stores 33 percent, superstores/warehouses have 9 percent and conventional supermarkets, 14 percent. By sales, however, these supermarkets have 33 percent of the market, superstores/warehouses have 42 percent and convenience stores only 6 percent.

The physical layout of stores is changing as is the mix of products sold. This is in response to two large competitive threats: 1.) Wal Mart and 2.) Consumers' shift to fast food and take out food from other establishments. The response to Wal Mart is in the form of distributional reengineering and will be discussed later. The response to consumers continued desire for meals-to-eat verses food-to-cook has lead this industry into a flurry of activity to find the best way to sell food ready-to-eat. It is called "meal solutions" or "home meal replacement" and it dominates most of the business decisions in retail food stores today. Store layouts are changing to accommodate the shopper who wants to pick up a quick meal to eat on or off premise. The

traditional store where you are forced to walk through aisles of dry groceries to find the dairy and produce is evolving into a store where dry grocery is moved to the back left hand corner and fresh produce and deli food is up front, often with its own fast checkout stands. This is a deliberate attempt to capture a larger share of consumers' meal dollar. With over half of food purchased in food service places being taken out to eat, grocery stores need to be in this game. Between 1994 and 1996 the percent of consumers who reported that the grocery store was their primary place to get take out food jumped from 12 to 22 percent but the majority of take-out food sales are still going to restaurants and fast food places.

Supermarket Finances

The most frequently cited fact about supermarkets is that they operate on very small profit margins. In 1996-97 their average net income (total sales minus cost of good sold, taxes, interest and operating expenses) was 1.08 percent of net sales (0.53 percent for stores with less than \$100 million in annual sales and 1.26 percent for stores with sales over \$100 million). In addition, real dollar sales have risen less than 1.6 percent since 1992 and in "same stores", real sales have fallen by up to one-half percent in three of the past five years. It would appear that this competitive business is operating on the edge. It is not, however, unprofitable. Return on equity has been between 13 and 16 percent over the past four years and return on assets was between 3 and 4 percent.(FMI, 1997b).

Store expansions in this industry are notable. Some would say expansion is beyond the demand and population needs. The top 100 grocery chains, who account for two-thirds of all store sales, increased their number of stores by 26 percent to 20,134 stores since 1992 and the total selling space by 33 percent to 667,422 square feet. Sales per square foot increased only 4.1 percent over this period reflecting the maturity of this business. (Chain Store Guide) .

Food Delivery - Logistics

In 1992 the grocery store industry began to realize the impact of a major competitor - Wal Mart. At the time Wal Mart had only 50 stores that sold a full line of groceries, but they had arrived on the scene with the most sophisticated and integrated logistics system known to retailing. They had contracts with their suppliers for specific products at every day low prices. These products were to be delivered to distribution centers at specific times and to be dispensed to stores without delay. The lean inventory, warehouse and trucking system allowed Wal Mart to cut their operating costs 5 percentage points below the average in the grocery business, and they were planning to open more superstores with groceries in the future. By now they have over 370 food stores in the United States. Food sales of \$10 billion represents a five year growth of over 600 percent. They now rank 10th in food sales in the country. They have changed the landscape for retail stores of all types.

Large supermarket chains and their suppliers sat up and took note. Through their trade associations they began an initiative in 1992 called "Efficient Consumer Response" (ECR). The ECR national committee was formed. It is made up of representatives of food companies at all levels, equipment suppliers, and many others who were interested in designing a food delivery system that would be more efficient. At its heart is electronic data interchange (EDI) where

retailers would transmit real time sales data directly to manufacturers (or wholesalers and brokers who pass it on to manufacturers). This would provide a continuous flow of information about how fast each product was selling and the rate at which it should be replenished by the distributor and how fast manufacturing lines should be adjusted to speed up or slow down the production of fast (slow) moving items.

Many changes in management activities will accompany the full implementation of ECR. They include category management (identifying and eliminated slow moving items), activity based costing (ABC, assigning management and overhead costs to the departments or categories that use them), customer loyalty programs and electronic data transmission and analysis.

There are striking similarities between the activities of the ECR Committee in the 1990's and the Symbol Selection Committee of the early 1970's. The later worked arduously to design, promote and implement the use of the Universal Product Code (UPC bar code). Through careful and numerous contacts and much testing and research a workable UPC was developed, but adoption was slow and painful since stores did not want to invest in scanning equipment before all food packages had a bar code and manufacturers wanted to be sure the bar code would be scanned before they changed their packages to include it. Likewise adopting ECR practices is slow and meeting some resistance. Companies defined as chains (more than 11 stores) have been the most likely to divide products into formal categories (76 percent) and to transmit data to and from suppliers via EDI (68 percent). The average over all companies is 36 and 37 percent respectively. In January 1997 only 13 percent of all companies had adopted continuous replenishment programs and 15 percent were using ABC (FMI, 1997b). A study at the University of Minnesota showed that those stores which had adopted the largest number of ECR practices had the best performance, but the authors cannot tell whether good performance led to adoption or visa versa (Phumpiu and King).

ECR practices are the next major logical step in utilizing the power of the UPC code and scanning and computer technology. Scanning products upon purchase and being able to change prices in a central computer system and not having to put prices on each item, was a huge productivity boost to the supermarket business in the late 1970's. Since then, few technology breakthroughs or productivity enhancing changes have had as much promise as ECR. If ECR is fully implemented, it will push the industry in the direction of further economies of scale. Savings are promised to consumers who should benefit from a more efficient system. Many are skeptical of this, but as long as there is intense local competition for the consumer's food dollar, savings will probably be passed on to consumers.

ECR practices also lead to new partnerships involving tighter contractual relationships with first line suppliers and distributors. By sharing information about consumers' purchases and preferences retailers can and will have great influence on what foods are produced and delivered through the food chain. Studying the supply chain and how it evolves and performs is one of the new sciences in business schools and agricultural economics departments. Some of the phenomenon being examined are the concentration among producers, the benefits of captive supply, savings from inventory control and product flow, vertical coordination, international sourcing and new-age coops. The later are an example of micro opportunities that arise in niche markets with strong and special demands.

Other Trends

With the increase in food service operations in stores, food safety issues take on new importance. Fresh, unpackaged food is more vulnerable to spoilage and to contamination from handlers. Increased training of food handlers and the establishment of hazard control programs will increase. Informative labels about nutrition and ingredients is a larger challenge in freshly prepared food.

Continuing to make food more convenient while maintaining freshness, nutrition and taste is an ongoing challenge. The time most consumers expect to spend cooking (assembling) a meal is down to 15 minutes. This means that food must be virtually ready-to-eat when it comes into the home.

The growth of "grocerants", where groceries and ready-to eat meals are both available in the same store, is exciting and helps provide adventure and excitement in the store. It is not, however an economical way to deliver food to middle and lower income households. The formats of retail food stores may bifurcate even further. One of the challenges for public policy makers and for the food industry is to balance competition for the high-end food dollar while also serving the food needs of the poor. As the lines between food for home and away-from-home consumption blur, food stuffs eligible to be purchased with food stamps, or their electronic equivalent, may need to be recategorized.

Home delivery and Internet shopping for food is here and growing. Industry experts predict it will reach 10 percent of food sales in about 10 years. To be profitable, the technology of filling orders must find a way to bypass the grocery store and receiving deliveries must be more convenient than going to the store oneself.

Demographics and lifestyles dictate that stores will cater to older consumers, provide more services unrelated to food, and find new ways to attract customers on a regular basis. The ideal customer is the one who considers their grocery store to be their cook, kitchen and dining room, a place they feel at home.

More training of labor and finding labor saving technologies (high tech) while maintaining or even increasing the (high touch) service personnel will be critical. Good service is delivered by well trained and friendly people but they add to labor costs which already comprise over 38 percent of the cost of food. (FMI, 1997a)

Keeping prices low, adding services, increasing food safety and customer loyalty are among the vast challenges this industry faces. Part of the solution will be in tighter links to food manufacturers (including commissaries) and narrower specifications on acceptable food qualities and delivery time. This changes the nature of the food delivery system all the way back to the farm. This is a mature business but it has a steady flow of repeat customers. As long as consumers have numerous choices of what to eat and where to obtain their food, competitive forces should ensure favorable food prices and uphold our long tradition of decreasing the portion of household budgets needed for food.

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